VOL. 179 No. 5 AMERICAN OCTOBER 15, 19

Gas Journal

REYNOLDS

GAS CONTROL SINCE 1892

ECONOMICAL

LOW PRESSURE REGULATORS

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Especially designed for all LOW PRESSURE NEEDS

5 POUNDS MAXIMUM INLET PRESSURE— OUNCES OUTLET PRESSURE

Cross Sectional View of the NRW 600ED
1½" to 3"
Screw Connections
3" to 8"
Flange Connections
Wing Valves
Choice of "O" Ring or Leather Seats

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Also available as auto governor and as relief valve

REYNOLDS GAS REGULATOR CO.
ANDERSON, INDIANA, U.S.A.

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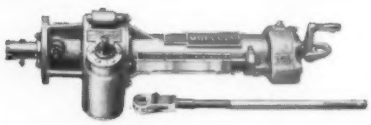
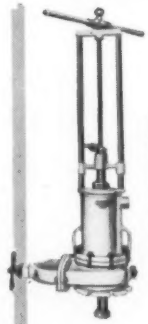


C-1 Drilling Machine

Makes 2" to 12" cuts through gate valves in any size cast iron or steel main – dry or under pressure. Power-operated with H-600 Air Motor or H-602 Gasoline Engine Drive Unit. Hand-operated model also available. Similar machines available in smaller sizes.

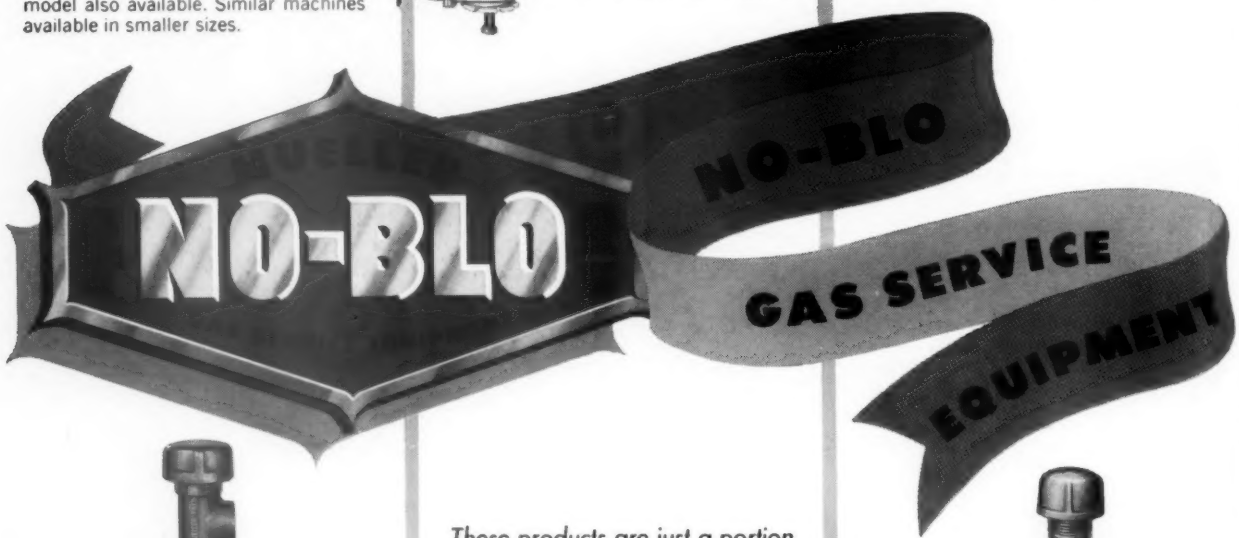


H-17340
Stopping Machine

Used to insert, expand and extract steel wedge line stoppers. Other models available for inserting stoppers ranging from ¾" through 8" under pressure.

H-17505 Flanged Tee

Used when making a large connection on a steel main. Permits locating valve on lateral line in most convenient place. Drilling and plugging of tee is done under pressure. Sizes 3", 4", 6" and 8".



H-17790
Machine Inserted Service Valve Tee

Designed for inserting directly into steel or cast iron mains under pressure, using the Mueller "B" Tapping Machine. Built-in valve gives complete control of the service at the main. Copper-encased neoprene gasket makes pressure-tight joint against pipe.

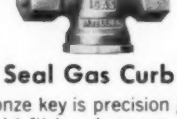
These products are just a portion of the complete selection of gas equipment, supplies and specialties offered by Mueller Co., designed and manufactured to traditionally high standards.

H-17490
Save-a-Valve Drilling Nipple

Permits removal of valve when connection is abandoned. Used when making a connection to steel pipe under pressure. Inside thread in nipple permits insertion of a plug under pressure. Completion cap makes double leakproof seal.

H-11170
LubOseal Gas Meter Stop

"O" rings are located at top and bottom of precision-ground and lapped key, assuring gas-tight seat. Lubricant is automatically pressure-fed to longitudinal grooves in key, assuring positive lubrication.



H-11104
"O" Ring Seal Gas Curb Stop

Inverted bronze key is precision ground to a gas-tight fit in a heavy cast iron body. Tight seatage is accomplished with stainless steel spring under key plus service line pressure. Seals located above and below gasway give positive assurance against top or bottom leaks.

MUELLER CO.

Dependable Since 1857

MAIN OFFICE & FACTORY DECATUR, ILLINOIS

B 446139 DEC

OUT OF NEW YORK goes a volume of shipping which makes *routing ocean freight* a problem. Ebasco has been engaged by a number of steamship lines to help solve this problem.

HOW EBASCO TEAMWORK HELPS BUSINESS AND INDUSTRY SOLVE SPECIAL PROBLEMS

Throughout the United States and in other countries around the world, Ebasco specialists—engineers, constructors and business consultants—are serving many different companies in many different fields.

Some of the services Ebasco offers are used by business and industry to handle projects such as those shown on this page. In turning such problems over to Ebasco, companies of all sizes, long established firms, as well as new businesses, find they obtain the extra manpower they need without adding to their permanent staff.

Perhaps Ebasco teamwork can serve you. Our booklet, "The Inside Story of Outside Help," describes the services we offer business and industry. May we send you a copy? Write or phone Ebasco Services Incorporated, Dept. S, Two Rector Street, New York 6, N. Y.

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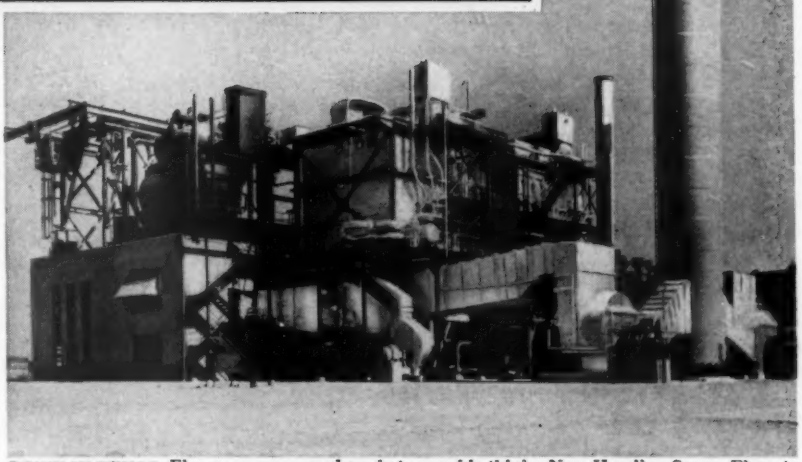
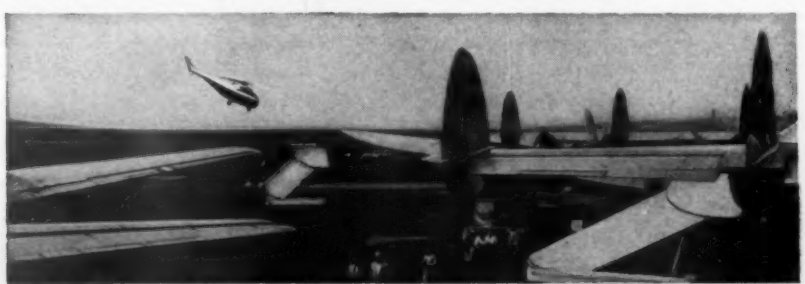


DOWN IN TEXAS, Ebasco was engaged to *design and build* the New Handley Steam Electric Station for Texas Electric Service Co. Located near Fort Worth, this modern plant provides economical electric power to a large part of the State.

TO CARACAS, Venezuela's beautiful capital, Ebasco specialists have gone to handle a *space planning program* for La Electricidad de Caracas. The program involved the planning and designing of a large office building and an ultra-modern service center.

UP IN CANADA, Ebasco specialists prepared an *industrial relations program* for the Canadian Comstock Company Limited. This is one of many such programs prepared by Ebasco for companies in the United States and abroad.



SUNNY CALIFORNIA lists aircraft manufacturing as one of its larger industries. One major company in this field used Ebasco consultants to help *reduce and control costs,* and to provide effective control and coordination of production schedules.

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Facts About Your Budget

Ever see a budget you didn't have to s-t-r-e-t-c-h to cover even the "must-have" items on the list? Here's help! You really stretch your budget dollars, make them do more and go farther when you specify "Cleveland" for your trenching equipment—as the gas industry has been doing for over 30 years. You do more trenching work—better, faster and cheaper—use less equipment—require smaller yearly investment—fewer manhours—smaller payroll—less repair and maintenance—with Clevelands. And their rugged, quality-construction and their proved extra long work-life mean that you *won't* be budgeting for replacement of worn-out equipment for years to come!

About Cleveland "Model 80"

Backfiller—Tamper—Side Crane

- *One* machine, *one* man operated does *three* big trench completion jobs: ① lays pipe, ② fills trench, ③ tamps fill—*plus* all types of light side crane work, pulls crossings, loads and unloads pipe, valves, etc.
- Lays pipe safely, smoothly with minimum man power. Over 3,000 lb. capacity at 6 ft.
- Live, telescopic boom, long reach. Sure clutches, smooth brakes.
- Backfills fast and clean from either side of trench—*toward* or *away from* machine. Fits wide range of trench sizes. Easy on lawns, sidewalks, etc. Does a beautiful clean-up job.
- Tamps thoroughly—delivers over 470 ft. lb. blow 42 times per minute—produces maximum practical compaction. Backfills, tamps, travels simultaneously. Travels *parallel* to trench, minimizing traffic interference.

LAYS PIPE . . . . FILLS TRENCH . . . . TAMPS FILL

About Cleveland "Baby Diggers"

- *One* machine does *all* your types of trench digging jobs—main extensions and services.
- Most efficient digging element, the wheel, digs all soils, in all weathers.
- Compact, highly maneuverable, easy to work in tightest places, right up to building walls, between obstructions, etc.
- Extremely portable—cover scattered jobs easily—travel at truck trailer speed.
- Easy on walks and driveways, no tires to spin and gouge lawns.
- Choice of models—depths from 3½′ to 5½′, widths from 9″ to 24″, digging speeds from 6″ to 29′ per minute, providing *right* speed and power combination for *every* job condition.

P. S. • The vast majority of gas companies who do their own trench work do it with CLEVELANDS.

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AMERICAN Gas Journal
ESTABLISHED 1859

VOLUME 179 OCTOBER 1953 NUMBER 5

This month...

There should be a time and a place to extol with unstinted praise and profound gratitude the contribution that retiring AGA President Frank C. Smith has made to the rejuvenation of energy, the quickening of spirit and the revival of faith in the gas industry that he has so ably served.

Long before his elevation to the presidency of the association, he had recognized and registered as his profound personal conviction the belief that the future of the gas industry rested, as it does rest, on sales leadership by the gas utilities.

He recognized also that only a united industry, embracing, as one, the gas companies and the manufacturers of gas appliances, could effect the transition from slide-rule thinking to merchandising-awareness that has become the new cornerstone of gas industry development.

That gas industry unity, of a solidity unknown in decades, has been achieved is a tribute to Frank Smith above any other one man.

It is a tribute that he will be the first to wave aside, if it means no more than a personal encomium. It is a tribute that can grow into a lasting testimonial if the gas industry, in the years to come, proceeds with unwavering determination along the path that his leadership has so brilliantly outlined.

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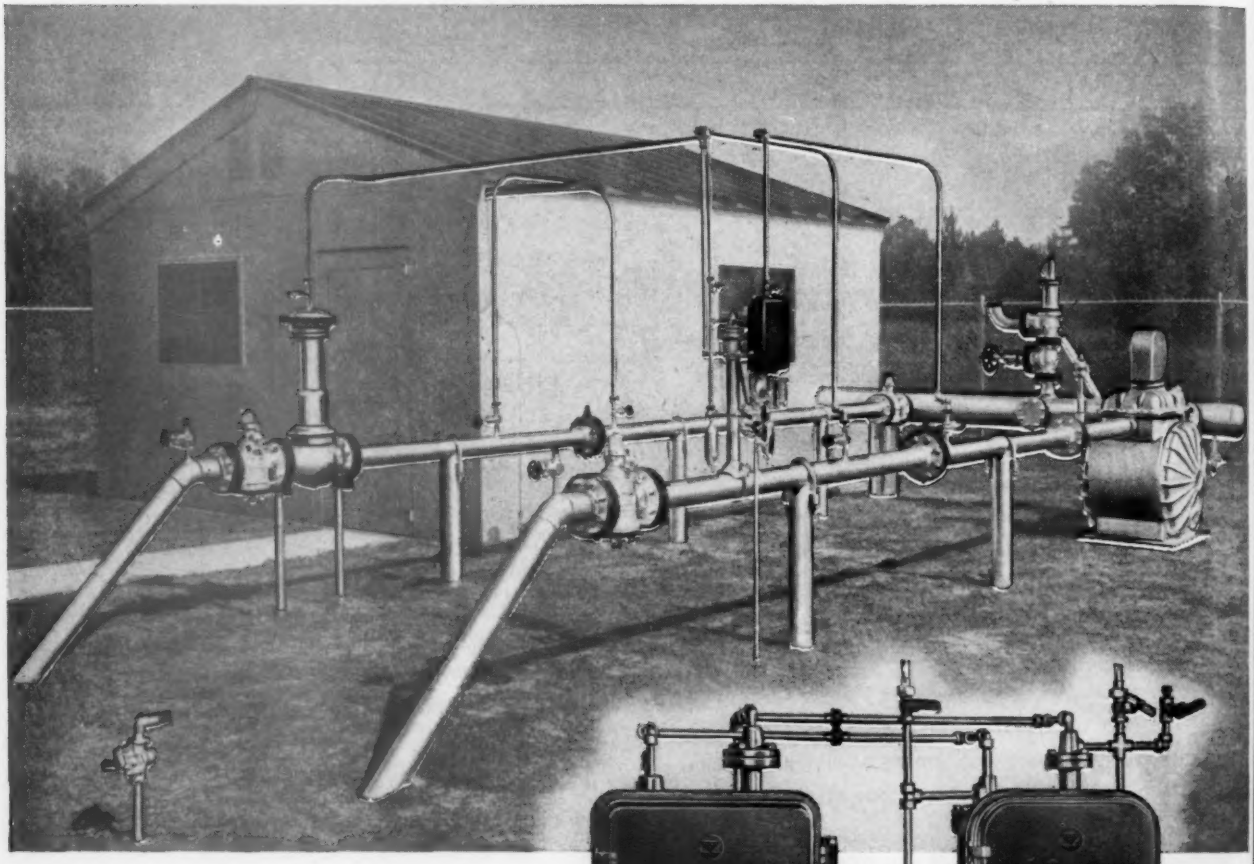
PRECISION GAS MEASUREMENT AT HIGH OR LOW FLOW RATES

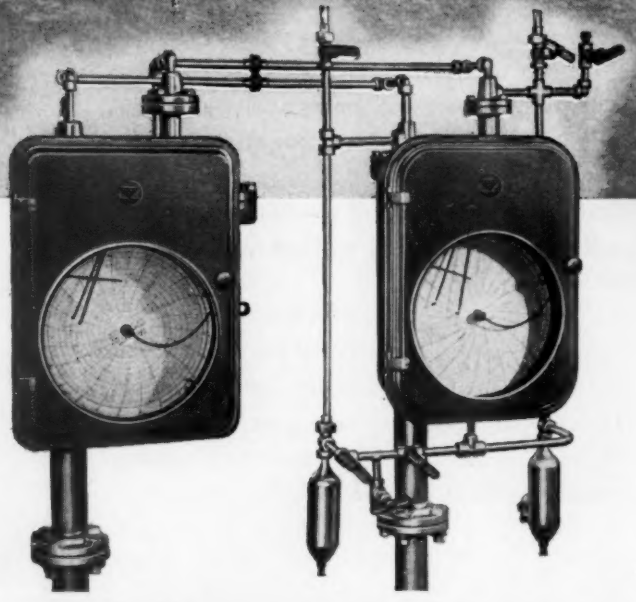


Southern Natural Gas Company Accurately Records Intermittent High and Low Volume Measurements.

Flow rates from zero to 154 thousand cubic feet of natural gas per hour are measured by this fully automatic measuring station.

An American® 500B, 250-pound Ironcase Displacement Meter measures flow rates up to 31,000 cubic feet per hour. Demand volume and meter pressure are recorded by a seven-day 100-pound American Volume and Pressure Gage.

A 100-inch Series A-88 American Differential Valve actuates a 4-inch Type CBVA Reliance Control Valve transferring approximately 80 percent of the flow to the orifice meter run when flow rates exceed the capacity of the Ironcase Meter.



This Duplex installation consisting of 20-inch — 100-inch Series A-88 American Westcott Orifice Meters records 80 percent of the flow at rates from 31 thousand to 154 thousand cubic feet at normal operating pressures of 50 pounds gauge pressure in the orifice meter run when used in the above combination with the 500B Meter.

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INCORPORATED | ESTABLISHED 1903

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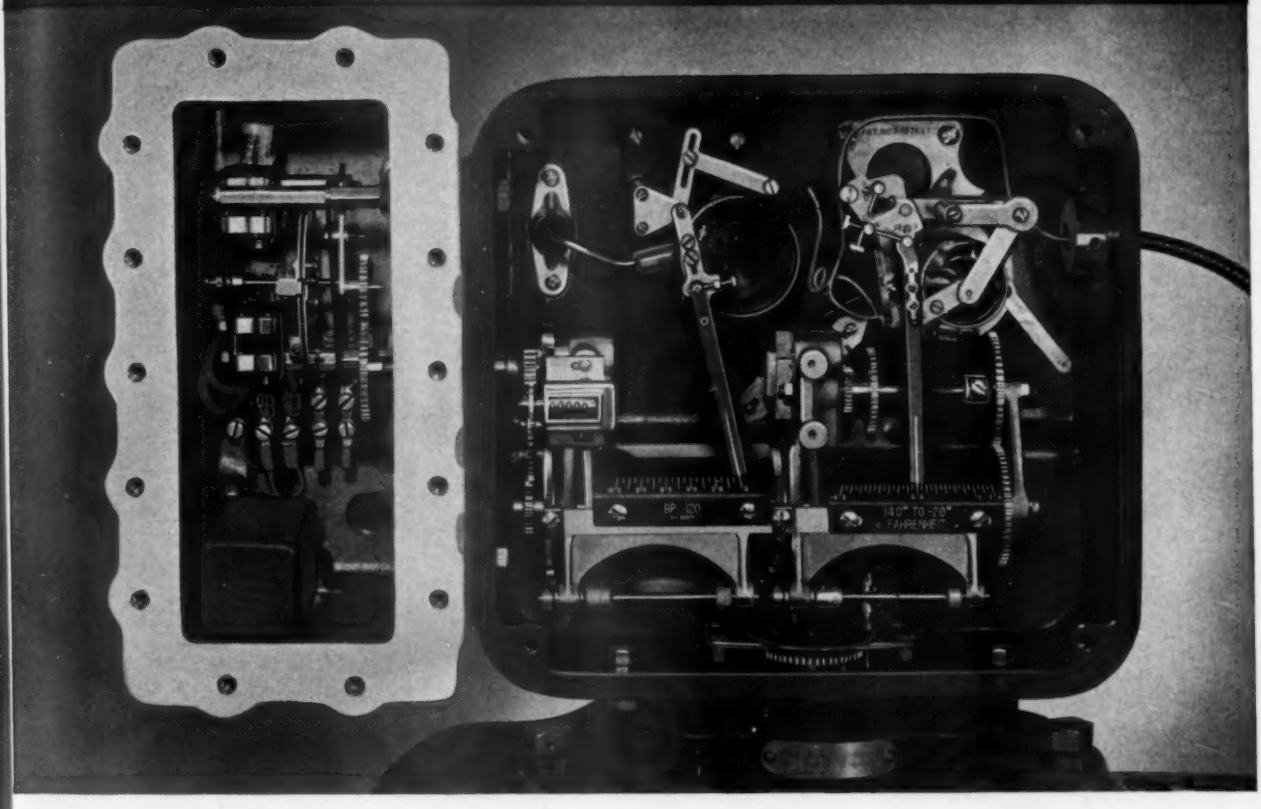
NEW AMERICAN® TELECOUNTERS
for base volume indexes



Now you can read base volume indexes at any remote location

American Telecounters accurately transmit Base Volume Index indications of gas quantities, computed to base temperature and base pressure conditions, to any convenient reading station. Remote indications are read from a compact reset-type counter which installs anywhere. The counter is actuated by electrical impulses received from the transmitter housed in the explosion-proof case on the side of the Base Volume Index.

- **Reset-Type Counter only 1 5/8" x 4"**
- **Explosion-Proof Transmitter Case**
- **Adapts to Large Capacity Ironcase Meters**
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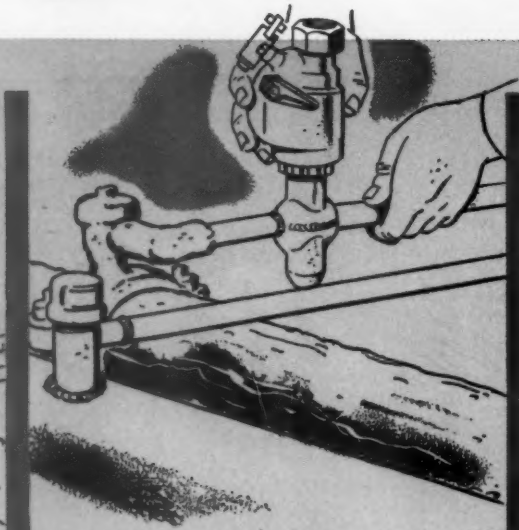
AMERICAN METER CO. EST. 1836

AMERICAN® METER COMPANY
INCORPORATED

TRANSFER SERVICES FROM OLD MAIN TO NEW MAIN..

STEP 1. WELD SERVICE TEE TO NEW MAIN AND LINE STOPPER FITTING TO OLD SERVICE LINE.

CAPS AND PLUGS REMAIN IN PLACE — HAND TIGHT — DURING WELDING. WELD A SHORT LENGTH OF SERVICE LINE TO OUTLET OF SERVICE TEE.

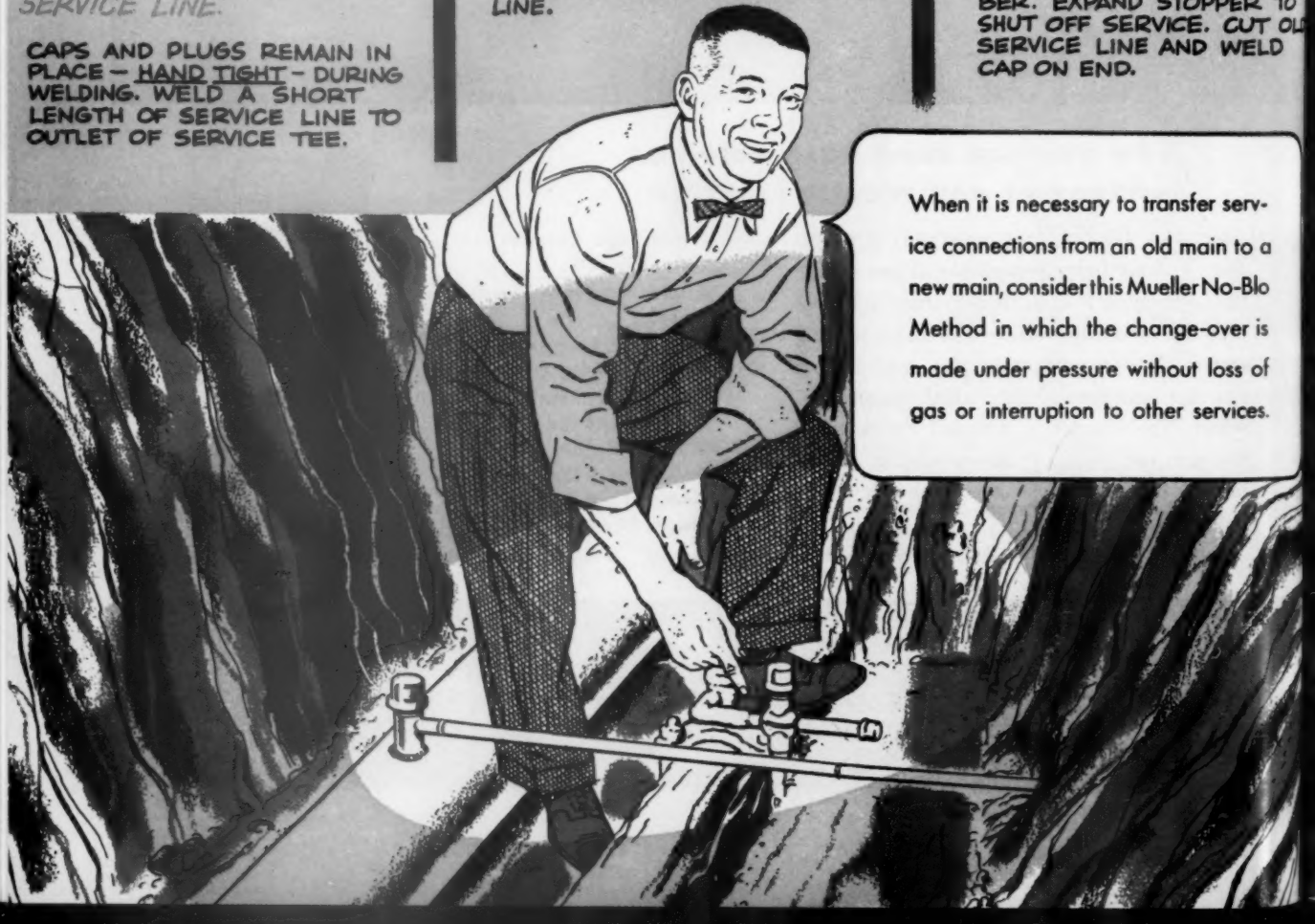


STEP 2. MAKE CUT THROUGH OLD SERVICE LINE.

ATTACH A MUELLER CONTROL CHAMBER TO LINE STOPPER FITTING AND MOUNT AN "E-4" DRILLING MACHINE. (A "T" DRILLING MACHINE MAY ALSO BE USED) MAKE CUT COMPLETELY THROUGH LINE.

STEP 3. MAKE STOP-OFF.

ATTACH RUBBER STOPPER TO "E-4" MACHINE AND REMOUNT ON CONTROL CHAMBER. EXPAND STOPPER TO SHUT OFF SERVICE. CUT OLD SERVICE LINE AND WELD CAP ON END.

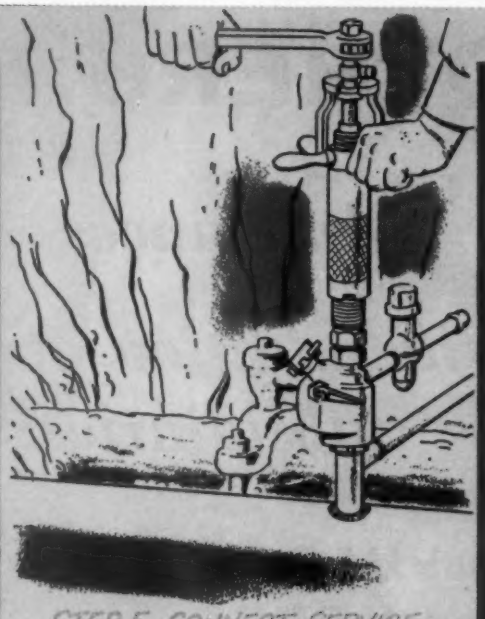


When it is necessary to transfer service connections from an old main to a new main, consider this Mueller No-Blo Method in which the change-over is made under pressure without loss of gas or interruption to other services.

SAFELY UNDER PRESSURE!

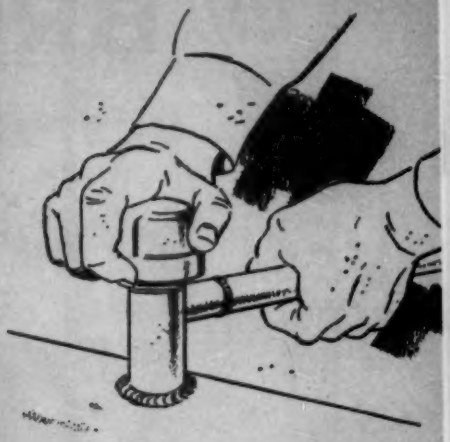
STEP 4. PLUG LINE STOPPER FITTING.

TTACH BRONZE COMPLE-ON PLUG TO SHAFT OF -17045 COMPLETION MA-HINE AND MOUNT MACHINE N CONTROL CHAMBER. CREW PLUG INTO FITTING, EMOVE MACHINE AND CON-ROL CHAMBER AND SCREW OMPLETION CAP ON TOP F FITTING.



STEP 5. CONNECT SERVICE LINE TO NEW MAIN.

WELD OLD SERVICE LINE TO SHORT SECTION OF LINE ON SERVICE TEE. ATTACH CONTROL CHAMBER TO SER-VICE TEE AND MOUNT "E-4" MACHINE. DRILL HOLE INTO MAIN TO PUT SERVICE BACK IN OPERATION.



STEP 6. CAP SERVICE TEE TO FINISH JOB.

INSERT BRONZE COMPLE-TION PLUG WITH H-17045 COMPLETION MACHINE AND REMOVE EQUIPMENT. ATTACH COMPLETION CAP AND TRANS-FER IS FINISHED IN COMPLETE SAFETY— UNDER PRESSURE— WITH NO LOSS OF GAS. (AFTER OLD MAIN HAS BEEN REMOVED, SERVICE LINE STOP-PER FITTINGS MAY BE SAL-VAGED FOR FUTURE USE.)

MUELLER NO-BLO **Method**

This is another of a series of gas distribution problems and their step-by-step solution by Frank Miller, Gas Service Engineer of Mueller Co.

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Dependable Since 1857

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NATURAL GAS ODORIZING CO., INC.

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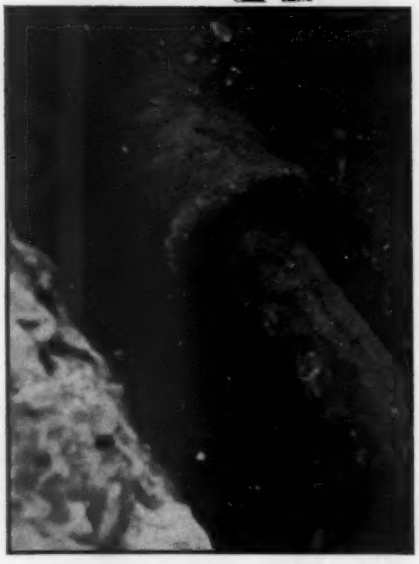
Making the best still better

Sounds impossible, doesn't it . . . improving the cast iron pressure pipe that has served so many communities so long and so faithfully?

But the fact remains: today's *modernized* cast iron pipe is better than ever . . . stronger, tougher, more uniform in quality . . . even more economical and efficient than the cast iron pressure pipe that serves . . . and has served . . . for centuries.

And that's exactly what we offer the gas industry. Modernized cast iron pipe . . . cast centrifugally for greater strength and toughness. Equipped with standardized mechanical joints that are bottle tight for all approved working pressures and for all types of gas.

If you want the most efficient and economical pipe ever made for gas distribution, your new mains will be laid with cast iron pipe, centrifugally cast and with standardized mechanical joints. Cast Iron Pipe Research Association, Thos. F. Wolfe, Managing Director, 122 So. Michigan Avenue, Chicago, 3.



This cast iron gas main is in good condition after over 100 years of service in Providence, R. I.— one of more than 45 cities with century-old gas or water mains in service.

Modernized **cast iron**

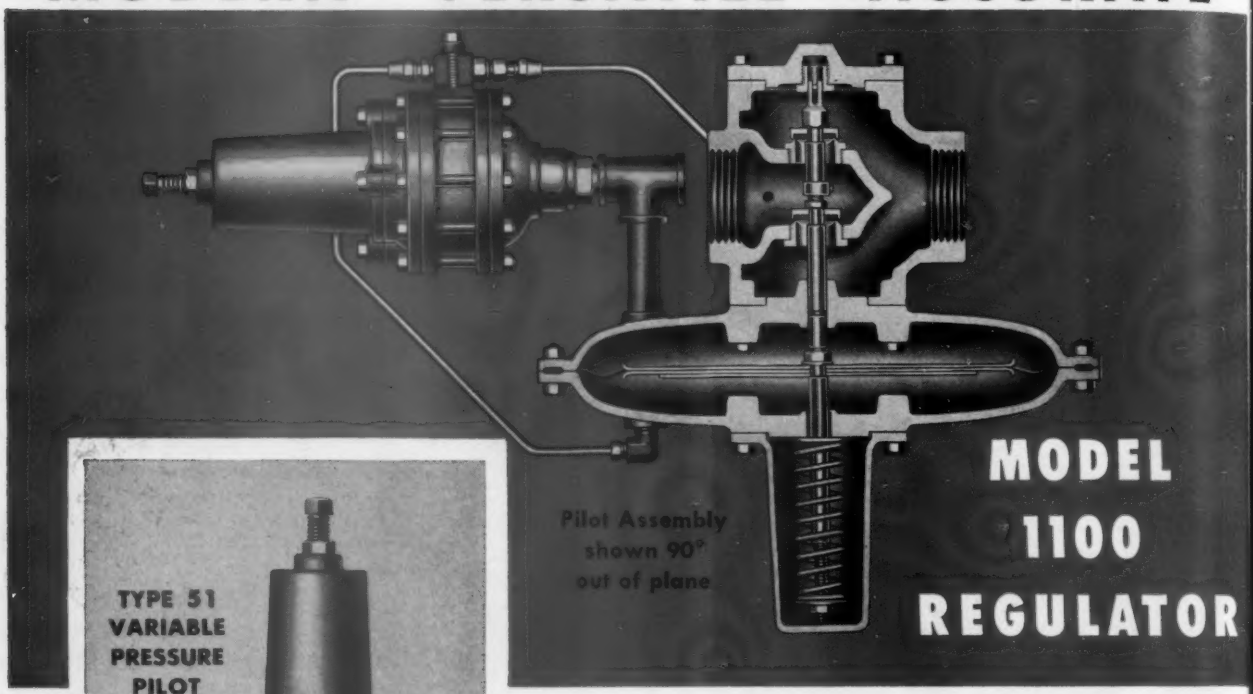
CAST Q IRON

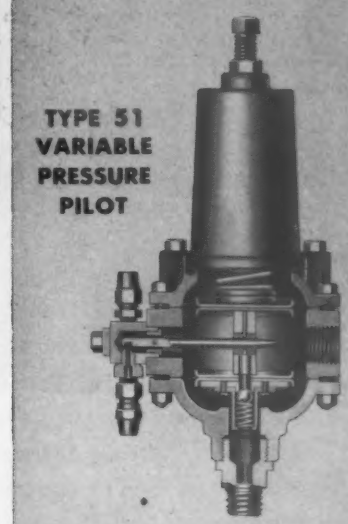
The Q-Check stencilled on pipe is the Registered Service Mark of the Cast Iron Pipe Research Association.

pipe for Modern Gas Distribution

Chaplin-Fulton

MODERN—VERSATILE—ACCURATE





• the heart of the MODEL 1100 assembly, insuring precisely accurate control over the complete flow range. • Unitized construction—valve lever and orifice as a unit are removed from the outside, without disturbing balance of assembly. The likely trouble spot—the orifice—is placed outside where you can get at it quickly—no internal tubes to clog. • Twin diaphragms remove as a unit. • Internal relief unit—guards against overpressure. • Spring unit—remove three screws to change springs. • Built for service. • Used for accuracy.

You can't buy, beg, borrow or steal a more versatile pressure regulator than MODEL 1100. Nor has traditional Chaplin-Fulton ruggedness, simplicity or accuracy been forgotten in this new modern design. Size—2" only.

Wider Application —Inlet Max.—250 psi. Outlet Range—1" to 75 psi or 50 to 150 psi.

Greater Capacity —24,000 CFH at 10 psi to ounces; 114,000 at 100 psi. Body contoured for flow.

Easier Maintenance—regulator or pilot can be serviced without disturbing the other. Quickly accessible orifices in both, easily renewable.

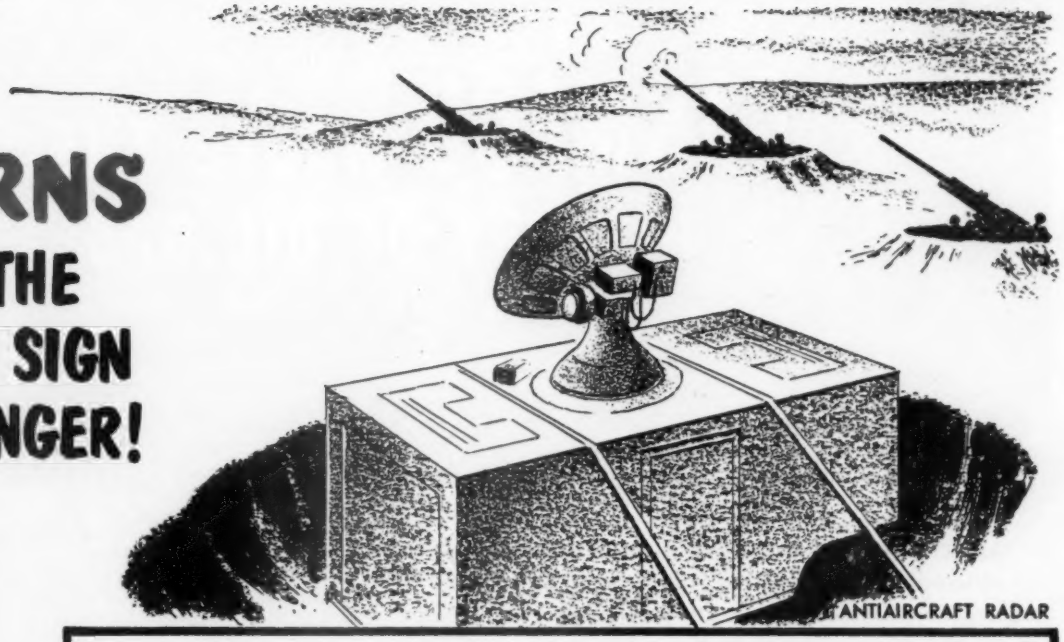
Simpler Installation—only one connection required. No complicated pins or toggles to adjust.

You can standardize on MODEL 1100 for a wider range of your industrial, commercial or distribution installations.

ACCURATE CP MFG CO. DEPENDABLE

Chaplin-Fulton
MANUFACTURING COMPANY
Pittsburgh 25, Pennsylvania

WARNS AT THE FIRST SIGN OF DANGER!



SHARPLES Spotleak

Like antiaircraft radar, Spotleak warns at the first sign of danger. SPOTLEAK 1008 and SPOTLEAK 1009 are new fuel gas odorants introduced this year by Sharples Chemicals Inc.

Have you investigated these new gas odorants?

SPOTLEAK 1008
for liquid injection odorization

Because of its high potency is:
Economical—reduces amount needed and handling.
Versatile—can odorize both long transmission mains and vast distribution grids.

SPOTLEAK 1009
for either evaporation by-pass or liquid injection systems

Very stable—resists fading—remains active after long contact time in the gas stream. Uniform composition means uniform odor.

OTHER SHARPLES ODORANTS

Pentalarm 86 **Pentalarm 1004**

SHARPLES CHEMICALS INC.

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GASMACO WROTE THE HISTORY OF OIL GAS

1912
1933
1942
1947
1948
1949
1950
1951
1953

MANY YEARS AGO The Gas Machinery Company entered the field of oil gas production and ever since has unceasingly maintained a policy of development and expansion. In the multiple phases of oil gas process and equipment we have always been in the forefront . . . the Leader. We have been The Pioneer in this ever-changing industry, where being first and staying first is indeed an achievement.

A few of the milestones, or yearmarks in the history of Oil Gas and The Gas Machinery Company:

1912 — Design and construction of low Btu Oil Gas Generating Equipment for the Pacific Coast.

1933 — Development of process and equipment for Hi-Btu Oil Gas with solid fuel heating. Contributed by members of the gas industry including W. E. Steinwedell of Gasmaco.

1942 — The Blain Process. Hi-Btu Oil Gas with oil heating in Single Generator and Twin Generator sets.

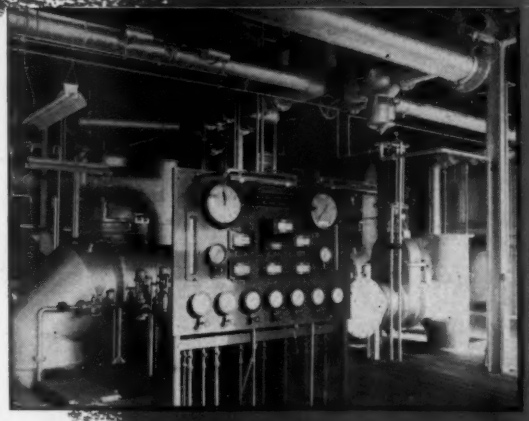
1947 — Four Shell Regenerative Oil Gas Apparatus for heavy oils. (Hall A.G.A. Process).

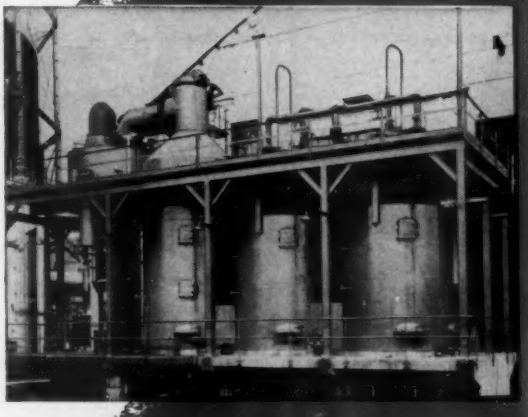
1948 — Two Shell Regenerative Oil Gas Set. The Inverted "U".

1949 — Back Blast modification of existing sets to accommodate heavy high carbon oils and improve efficiency.

1950 — Low cost conversion methods, adapting water gas plants to natural gas substitutes.

1951 — Development of new and improved auxiliary equipment for Tar Handling, Gas Washing, Oil Scrubbing, Light Oil Recovery and other problems peculiar to Hi-Btu Oil Gas.





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Editorial:

No Glamor?

WHAT'S all this we hear about "the 1954 Mrs. America won't necessarily have to be glamorous," but "will be rated primarily on her ability to cook, shop, run her household in a modern way and keep her husband and children happy"? This seems to be the pitch, as embodied in the official press release on American Gas Association's participation in next year's contest to establish the matron who will reign as the "national symbol of homemaking."

Maybe she doesn't have to be glamorous according to the rules, but we are ready to make a winter book at about 7 to 3 that the 1954 winner *will* be a cute little trick and if her husband doesn't happen to be happy that will be just his tough luck. We doubt if the contest judges will spend too much time investigating the old man's reactions, as why indeed should they? Husbands of beautiful women aren't supposed to be either happy or unhappy; their assigned task is just to go around *looking* happy, and proud. Particularly if the Mrs. gets to be a national symbol and comes home with a loving cup and $15,000 in prize money and assorted merchandise on which her Mr. America has the privilege of pungling up the income tax unless he wants to get slapped in the pogey for evasion, by you-know-who with the whiskers.

Our mild, and perhaps psychotic objection to beauty contests has never been wittingly associated with any aversion to contemplating at leisurely length the Form Divine, as the poet puts it. What we dislike is the way the contest framers insist on insinuating their own brand of genteel hypocrisy into our reveries. No sooner are we immersed in such interesting and memorable statistics as Bust 36; waist 28; thigh 17 (inches each that means) than we are asked to mark well, and remember, that the girl also reads Homer in the original Greek, plays the piano like Harry Truman and knows how to select the cheaper cuts of meat when she goes to an approved supermarket.

Frankly, for us, these marginal accomplishments seem to kill the deal, and we earnestly hope that AGA, the participating gas companies and the supermarkets will just wink at the rule about pulchritude being no factor in deciding the winner. It will certainly make it easier for the press agents.

Sitting Still

The Public Relations program proposed to member companies by a special committee of AGA early this year is just sitting still, like a duck frozen in the ice, because only about 80 percent of the necessary support has been pledged by the gas utilities. When the activity was first outlined the committee decided, and wisely, that unless it had the backing of companies representing at least 60 percent of total gas industry revenues from ultimate consumers it would not be launched.

It is ironical, but to those who know the industry it is by no means surprising, that some of the companies whose executives were the most voluble with suggestions on the need for planned public relations are still dragging their feet now that the time has come to support them. And another paradox is the fact that many if not most of the utilities that have already pledged their support are those that already enjoy a high degree of public acceptance and confidence, and might justifiably be said to need national assistance the least.

Probably as few as a half dozen men, all of whom may be present at the AGA convention in St. Louis this month, could insure the immediate launching of this worthwhile endeavor by merely saying the word for their own companies.

Currently the gas utility industry and the gas appliance manufacturers are well launched on their joint Industry Development Program. And while the public relations proposals are not organizationally incorporated in this action plan, the attainment of their objectives is essential to its fruition.

This is not the time to interpose objections to minor details. Every public relations program ever launched has been subject to revisions and improvements as its influence expanded, and in the light of practical experience and developments.

The vital thing as far as the distributing gas utilities are concerned, is that they are now the only segment of the gas industry that does not have a major organized public relations program. And they need it the most.

Elliott Taylor

New Capacity Credit Method Provides for

The Capacity Credit Method here proposed is a new method developed specifically for satisfying the operating conditions of gas transmission and distribution systems with particular regard for interruptible supplies. The problem of cost allocation for pipeline transmission systems has been for many years the subject of discussion between the staff of the Federal Power Commission and the experts of the pipeline companies. It is believed that the Capacity Credit Method may prove a valuable contribution to a satisfactory solution of this problem.

Mr. Nissel who is a partner in the consulting firm of Foster Associates, Ridgewood, N. J., holds a Master's and Doctor's degree in electrical engineering and is a Licensed Professional Engineer in the State of New York. He is the author of numerous books and articles on cost allocation and rate making.

by Hans E. Nissel
Foster Associates

THE problem of costing public utility service has intrigued management and rate engineers for many years, and there is hardly a subject in the entire industry more controversial than cost allocation. At first sight this is surprising, since great difficulties do not seem to exist in costing involving products of other industries. The complexity of the problem becomes apparent, however, when the unique situation of the public utility industry is recognized.

Hans E. Nissel

The cost pattern of a public utility is quite different from that of most other industrial undertakings. In the majority of industries, production, distribution, sales and delivery can be widely separated as to time and location since central warehouse stocks, goods in transit and local inventories bridge the gaps between these different functions and between producer and consumer. Market fluctuations are thereby cushioned and their impact is not immediately transmitted to the production facilities, which often can be kept working at fairly constant output irrespective of immediate market demand.

Capacity must equal demand

Public utilities do not find themselves in such a favorable situation. Since gas and electricity cannot be stored in appreciable quantities[1]—the same is true of telephone and public transportation service—a public utility has to produce, transmit, distribute, sell, measure and deliver its commodity or service to all its customers simultaneously and, at any time, in the quantities required by them. This not only means that production, transmission and distribution facilities must be of a capacity sufficient to cope with the total demand of all customers as to magnitude and duration, but it also requires that delivery and metering equipment must be specifically provided for every customer.

This peculiar situation would not necessarily create a problem, if it were not for the heavy daily and seasonal load fluctuations to which public utilities are subject. The capacity of a gas transmission system, for instance, must be able to meet the peak demand anticipated on the coldest winter day when gas requirements for space heating are at a maximum. This full capacity may be used during an entire year.

The situation would be serious enough if a public utility plant were inexpensive, but since such equipment is costly the capital investment is extremely heavy compared with annual revenue. In most other industries the invested capital is turned over several times a year. The major portion of the cost of the finished product is therefore labor and material, while the carrying charges on the investment—comprising return, depreciation expenses, Federal income tax and ad valorem taxes—constitute only a minor fraction of such cost. The capital invested in a public utility, on the other hand, greatly enhanced by the pyramiding effect of non-storability, heavy demand fluctuations and high cost of equipment, is turned over only once in several years. Consequently, carrying charges and other so-called fixed costs form the major portion of the total cost of public utility service. This situation has made it necessary to allocate fixed costs by special standards.

Expressions create confusion

The expressions fixed cost and variable cost, generally used in other industries, have created some confusion when applied to gas or electric utilities because so-called fixed cost becomes the variable portion, and variable cost becomes the fixed portion of the average cost per Mcf or kwh. It has been found desirable, also, to distinguish between the fixed costs associated with production, distribution, delivery, and general plant, respectively. The public utility industry has, therefore, adopted a special terminology. Fixed cost, as far as it depends on the capacity of a plant, is called capacity cost or demand cost, and to the extent that it is a function of the number of customers, it is known as customer cost. For variable cost, which is proportional to the number of commodity units produced or handled, the term commodity cost is generally accepted. Thus there are three dimensions of output in which cost can be measured, capacity, commodity and customers. Since these factors may be presumed to cause cost, the three dimensions are defined as cost causations. Finally, there remain certain expenses which do not vary in any of these three dimensions, and which are grouped under the heading of general cost. The major component of this item is the cost of central administration and management.

Classification of elements

There is generally not much disagreement on the classification of the various cost elements, carrying charges and operating expenses, under these cost causations. For a pipeline system, all carrying charges on production and transmission plant are recognized—although not always treated—as capacity cost; those related to metering equipment are recognized as customer cost, and carrying charges on administrative offices, telephone and transportation equipment not charged through clearing accounts, are recognized as general cost. All operating expenses of mains are to be considered capacity cost, since they depend only on the extent and capacity of the system and not on the volume of gas transmitted. Those expenses related to town border stations and other sales metering equipment, and the customer accounting and collecting expenses, are customer cost. Operating expenses of compressor stations, on the other hand, must be broken down into capacity and commodity cost in accordance with the operation of such plants. The same treatment is to be applied to the operating expenses incurred in connection with production, gathering, and purification. Cost of gas purchased under a commodity contract is classified as commodity cost, but must be broken down into capacity and commodity cost, if the contract contains a demand charge or equivalent provision. Finally, there remains the general cost which was identified before.

Gas transmission pipelines are designed and operated on the basis of daily capacity requirements and all capacity cost is found under what is

[1] Underground storage is somewhat alleviating this situation for gas transmission systems.

Allocations of Costs in Gas Systems

termed daily capacity cost. For gas distribution utilities only a portion of the capacity cost, in particular that connected with the production plant, depends on daily demand because storage facilities compensate hourly load fluctuations. This portion is daily capacity cost. Distribution mains, as far as they do not benefit from the operation of the storage holders, have to be designed to meet the maximum hourly demand, and this related cost is hourly capacity cost. Because of their association with production and distribution facilities, the terms production and distribution capacity cost are often used synonymously with daily and hourly demand cost. The so-called frontage mains of a distribution system are, to a minor extent, capacity-related and the associated cost is generally treated as customer cost. Otherwise, the principles applied to gas transmission pipelines hold good for distribution systems.

Basic principles

If a cost analysis is to provide objective results and supply the information required by management and regulatory authority as a basis and guide for rate making, it is most desirable that all cost elements be kept clearly under the cost causation to which they belong. Thus carrying charges, comprising return, depreciation expense, Federal income tax and ad valorem taxes, should not be treated as if they were partly commodity cost, since they tend to lose their identity and can be neither properly allocated nor recognized in the end results. Equally, certain operating expenses like those of gathering lines, which are capacity cost, should not be arbitrarily allocated on a commodity basis. Finally, general cost should not be split among the three cost causations, but should be kept as a separate item and shown as such for each class of service. If these basic principles are adhered to, a cost analysis will be meaningful and provide an objective and clear picture of the actual cost structure.

After the cost elements are broken down by cost causation, they must be allocated to the classes of service by capacity, commodity and customer cost responsibilities. Responsibility for commodity cost is strictly in proportion to commodity units or Mcf handled, i.e. produced, purchased, or transmitted. Customer cost is to be assigned specifically on the basis of plant and services used. Allocation by number of customers, or stations, is only admissible if there is sufficient uniformity in size and operation. However, where town border stations or meters differ materially in size, and meters read at varying intervals, individual assignment is essential.

In allocating capacity cost, it must be recognized that capacity is available continuously and is used in varying degrees every day. The different service classifications are therefore responsible for capacity cost in accordance with the use they make of such capacity throughout the whole year.

If all classes of service had a constant demand, i.e. were operating at 100% load factor and never deviated from their average demand, no problem would arise since all capacity would be continually used and there would be no unused capacity. In this case, capacity cost would simply be assigned in proportion to the commodity units used by each class of service, because every Mcf is required to maintain this ideal condition and is responsible for the same amount of capacity cost.

Capacity cost allocation

Since some, or all, classes of service deviate at times from their average demand, the system load shows proportionate fluctuations, and during long periods a substantial portion of the capacity remains unused. It is the proper assignment of this unused capacity, and the cost associated with it, which solves the much disputed problem of capacity cost allocation.

An equitable method of capacity cost assignment must charge the 100% load factor customer with the cost of capacity used by him continuously, no more and no less; it must charge a low load factor customer with more capacity cost than a high load factor customer, and the cost assigned must increase as the load factor decreases; the method must also give weight to the relative contribution of a customer to the maximum demand of the system and therefore consider diversity; and finally, it must charge the off-peak and interruptible customer less than a 100% load factor customer, in fact, the greater the curtailment the less it must charge him.

Neither the peak responsibility, the maximum demand, nor the volumetric method fulfills these conditions. The peak responsibility method ignores off-peak customers completely and does not consider the load factor. The maximum demand method shares the total cost among all customers in proportion to the arithmetical sum of their individual demands and ignores the incidence of these demands and the contribution of each customer to the system peak. It treats off-peak customers and on-peak customers alike, and charges the 100% load factor customer less than his actual capacity requirements. The volumetric method, whether used openly or in disguise by treating capacity cost as commodity cost, ignores completely the capacity element which is of decisive importance, and favors low load factor customers—penalizing high load factor, off-peak, interruptible customers.

Used and unused capacity

The Capacity Credit Method here proposed fulfills all the conditions required and avoids the shortcomings of the other methods. (It is the only method known to this writer which has been developed specifically for satisfying the operating conditions of gas transmission and distribution systems and for the particular situation of interruptible supplies). It basically recognizes the used-unused capacity concept, without which capacity cost behavior cannot be understood. Used capacity, means capacity needed for satisfying the daily, or hourly, requirements of a customer or a customer classification. For a given period it equals numerically the commodity units, or the sales. Unused capacity, is idle capacity not needed during any day, or hour, for satisfying such requirements. In the application of this method it is considered to be the difference between maximum used capacity or maximum demand, and capacity used during a certain day or hour. For a definite period, say a year, unused capacity equals the maximum daily or hourly demand times 365 days or 8760 hours, respectively, less sales during this period.

Used and unused capacity are measured in $\frac{\text{Mcf}}{\text{day}}$ x day (or $\frac{\text{Mcf}}{\text{hour}}$ x hour). Since the expressions day, above and below the line, eliminate each other, the unit becomes Mcf which is not to be confused with the unit used to measure quantities of commodity. While Mcf, when used as commodity unit, applies merely to a volume of gas unrelated to its daily or hourly rate of flow. As a unit of used or unused capacity it refers to a definite daily or hourly flow of gas effective for a certain period. The method here described must not be confused with a volumetric cost assignment.

If there are no off-peak or interruptible customers to use idle capacity when it is not required by firm customers, the firm customers would obviously have to bear the full cost of used and unused capacity. In this case, the problem consists in the proper sharing of unused capacity among firm customers. How-

(Continued on page 37)

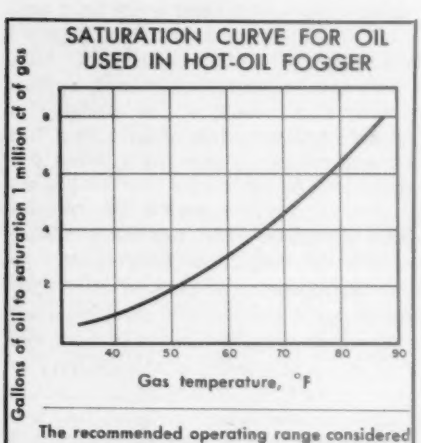
How Minneapolis Gas Company Bene

by P. W. Kraemer
Manager of Utilities
Minneapolis Gas Company

OPERATING difficulties with cold oil foggers are characterized by a concentration of oil in the distribution system near the fogger and a proportionate lack of oil as the distance from the fogger increases. The result in some instances has been to have excess oil entering the gas services near the fogger and dust flow in the mains and services in areas remote from the fogger. Increasing fogging rates aggravated the excess oil areas, and so during peak load periods in critical areas it was necessary to fog from portable hot-foggers to alleviate the situation. Improved fogging methods were necessary in order to produce a controllable and stable oil fog.

In the latter part of 1947 we began to study oil fogging first with an attempt to improve the cold fogger. After some experimentation it was concluded that to produce oil fog mechanically was not practical. At best, the average droplet size was too large for good carrying power in normal gas flows. It was reasoned that hot-oil fogging, bubbling gas through hot oil and then into a centrifuge with sweep gas, could be improved. The use of that method results in a carry-over of oil particles from the bubbling, coalescence of particles by the cooling sweep-gas and tortuous piping or turbulence, and thus depositing in the main gas stream many oil particles with little carrying stability.

It was theorized that by maintaining a pool of oil at a temperature to produce a sufficient vapor-pressure, gas could then be passed over the oil surface at a controlled rate to result in a dilute oil-vapor and gas mixture. If the mixture was at sufficient dilution and heat loss of the mixture were at a minimum oil could be deposited into the main gas-stream as a true vapor. The immediate great dilution by the relatively large volume of main gas would produce a fog in extremely minute particle sizes for maximum carrying power.



The recommended operating range considered in this chart is 360-to-380° F; the oil distillation range is 580-to-760° F.

Guided by the fog rate requirements of the fogging oil, shown by the accompanying saturation curve, a fogger was sized with the capacity for the send out of the district regulator installations. The most practical and safe method of maintaining the desired oil temperature range of 360° to 380° F, in a vault-installed fogger, was by means of electric immersion-heating units.

Fogger operation

The oil-supply tank being mounted higher than the fogger maintains a constant level of oil in the fogger through the connecting vacuum line and oil supply line. Heat traps in those two lines prevents oil circulation or oil build-up in the fogger due to the temperature difference of the supply oil and fogger oil.

The heating of the fogger oil is accomplished with electric immersion-heating units designed for use with non-circulating oil systems. The use of such a low surface-temperature heating unit prevents carbonization of the oil. The temperature sensitive bulb of the limit control inserted in a well in the heated oil maintains the desired constant temperature through the control circuit.

Gas from the high pressure side of the regulator enters the fogger through the vaporizer-tube, and is blown onto the surface of the heated oil. The resultant dilute oil-vapor gas mixture flows directly through the outlet near the top of the fogger tank and into the low-pressure gas stream.

In case of the depletion of the oil supply a second temperature sensitive bulb in the well mounted directly beneath the vaporizer tube is exposed and cooled by the gas inlet; the cooling opens the control circuit to shut off the heating elements which then must be turned on manually.

The relationship of the gas supply to the oil send out may be plotted as shown by the accompanying performance curves. By inserting an orifice of known characteristics, a pressure regulator, and a pressure gauge in the gas supply line to the vaporizer tube, it is possible to preset the exact oil send-out by adjustment of the regulator pressure. A more elaborate and effective gas supply hook-up will be in use later this year. This will tie the fogger regulator into the loading device of the district regulator in order to vary the oil send-out with the district regulator send-out. With such proportioning, service problems and drip problems caused by a high oil rate during low send out periods should be eliminated.

Fogger installation

The fogger installation is similar or identical to any other district regulator fogger installation as far as gas piping or connections are concerned except that the fogger and the oil fog supply line to the main must be insulated to prevent premature cooling of the vapors or excessive heat loss. An insulating layer of three-inch magnesia protected by cloth and a cement wash has been found very satisfactory.

The electric supply may, of course, present a problem in some localities and must be dealt with for each installation.

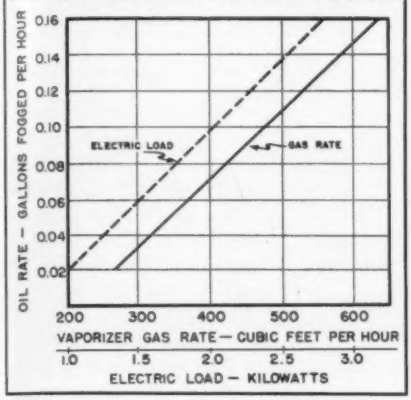
In order to eliminate the dangers of operating controls or contactors in the possibly explosive atmosphere of a regulator pit and the expense of explosion-proof cases for each electrical unit, it was felt advisable to mount all the controls outside of the vault. By mounting all of the controls in a weather-proof box on a post at the curb, and the use of long capillary tubes on the heat control bulbs, the only electrical connections to be made in the vault are those to the immersion heaters. The use of explosion-proof heads on the immersion heaters, a stock accessory with several manufacturers, and the fact that there are no electrical contacts to be made or broken in the vault results in a very safe installation. The fogger having multiple positive grounds through piping and conduit connections leaves no danger in the case of a short.

Costs

From the experience gained in constructing and installing the fogger now in operation, this is the estimated average cost for each fogger.

e Problems of Uniform Fog Flow

PERFORMANCE CURVES FOR THE MINNEAPOLIS HOT-OIL FOGGER



Fogger unit and supply tank	$125
Controls, heaters, and weatherproof box	170
Fogger installation	100
Electric installation	150
Total cost	$550

The performance curves show power consumption versus fog rate and so power requirements for any oil send-out may be calculated. For example, assume a regulator with a send-out of 50,000 cubic feet per hour to be fogged at the rate of 1 gallon per million. The fogger send-out would then be 0.05 gallon per hour and the power requirement 1.4 kilowatt. At a 3 cent per kilowatt hour electric rate, this operating cost would be 4.2 cents per hour.

Field tests

A fogger has been in operation in Minneapolis for about two years. The first year the installation was made in a distribution sub-station to allow easy accessibility during the determination of performance curves and to allow for slight construction changes to be made as required. During the second year the fogger replaced a cold fogger installation in a typical street regulator vault feeding a 16" low pressure header.

Before the cold fogger was replaced, gas samples were taken at equal rate and volume from the services in several houses along one mile downstream of the fogger and passed through filter paper in a tar-camera. Although not an exacting quantitative analysis the great amount of oil in the gas near the fogger and diminishing amounts as the distance from the fogger increased was easily discernable.

Equipment Designed for Underground Vaults

After the cold fogger was replaced the oil send-out of the hot fogger was adjusted to be exactly the same as the cold fogger had been and gas samples were taken again at the same locations. It was then noticed that the quantity of oil was uniform at each of the locations, a mile away or at the service about 15 feet downstream from the fogger.

Another remarkable and distinguishing fact was the quantity of drip collected in the main. The cold fogger necessitated the pumping of about 10 gallons of drip oil from the drip pot near the outlet of the regulator alone every month. No drip has been found downstream of the regulator or fogger during the period of a year which the hot fogger has been operating at the fogging rate of the replaced cold fogger.

Other field test data that has been very encouraging include:

1. The fogger has been operated continuously for one year with absolutely no service other than refilling the supply tank.

2. There has been no sign of carbonization of the oil even on the heater units.

3. There has been no sign of sludging of the oil from over 400 gallons of oil fogged to date.

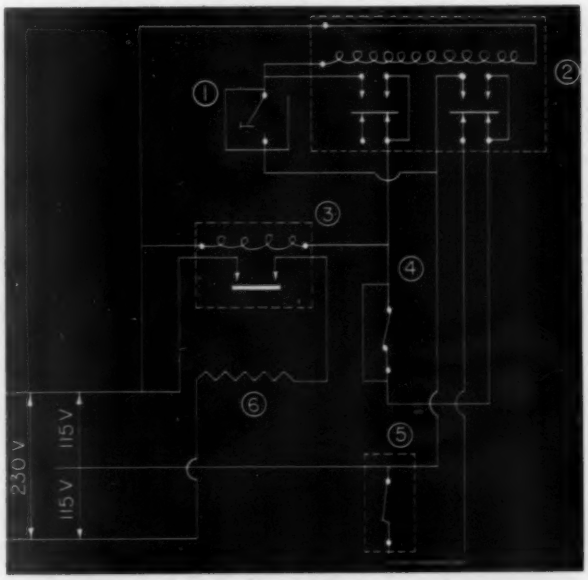
The performance of the fogger to date has been most favorable and now six additional foggers are being built for installation this year. Two of the installations will replace cold-oil foggers in areas where the dust and oil control problem has been most difficult to keep in balance. The other four installations will be made at new regulator installations.

Within another year we shall have available more information about the performance and versatility of this new oil fogger.

Adapted from a presentation to Mid-West Gas Conference and School September 1953

WIRING DIAGRAM FOR THE MINNEAPOLIS HOT-OIL FOGGER

1—Momentary contact push button for cold start
2—Dpdt magnetic relay
3—2-pole contactor
4—Remote bulb temperature controller—close on temperature drop
5—Remote bulb temperature controller—open on temperature drop
6—Immersion heating unit for non-circulating oil



Control contacts are shown in position for normal operating heating cycle. Control 5 is open on cold starts or upon oil depletion and relay must be energized manually for heating cycle.

South Carolina Electric & Gas Reviews Three Years of High-Btu Oil Gas

by John Sholar
Manager, Gas Operations
The South Carolina Electric & Gas Co.

A PROBLEM not uncommon to many operating utilities faced our company in 1950.

Studies made during the previous year in conjunction with Ebasco Services, Inc., crystallized the problem:

The existing carburetted water gas plant did not have sufficient thermal capacity to meet anticipated demands.

Production costs were too high, and rising.

More production capacity was required.

To effect operating economy it was desirable to modify existing process, or install a new process.

Gas cooling and other auxiliary equipment was inadequate for future loads.

Two possible solutions seemed to present themselves: (a) 650 Btu water gas employing heavy oil, or (b) 1,000 Btu oil gas with low-cost heavy oil.

With the help of estimates supplied by The Gas Machinery Co., a tabulation compared the 540 Btu water gas with the two alternates. This tabulation, together with the analysis and summary, may be of interest to other gas operators.

This study, comparing gas operations, was based on current fuel prices using these estimated solid and liquid fuel components:

	650 Btu	*1,000 Btu*
Heavy oil—gals/Mcf	5.04	13.28
Coke—lbs/Mcf	19.37	—
Tar credit—gals/Mcf	1	2.97

Labor savings were estimated at a minimum.

Distribution, operation and maintenance were included and reflect savings on 650 Btu and 1,000 Btu gas of approximately $5,000 and $12,600 respectively. Maintenance of pumping equipment was slightly decreased while the *saving in kwh consumption accounted for the greatest portion.*

The five year construction budget was examined and the elimination or postponement of certain items shown. The *major* items which could be eliminated from the budget were:

	650 Btu	*1,000 Btu*
12 ft. gas machine	$160,000*	$160,000
200M compressor	50,000	50,000
Minor distribution projects	31,000	78,000
Unforeseen major projects	36,000	90,000
6" loop line (Huger-Whaley-Rosewood belt line)		61,500
TOTAL	$277,000	$439,500

* Probably will be required in 1955.

Total expenses for plant changes and appliance conversion were estimated at:

	650 Btu	*1,000 Btu*
Plant	$ 80,000	$150,000
Conversion	22,000	170,000
	$102,000	$320,000

By spending $102,000* for 650 Btu gas and $320,000 for 1,000 Btu gas, savings were indicated as in Table 1, opposite page.

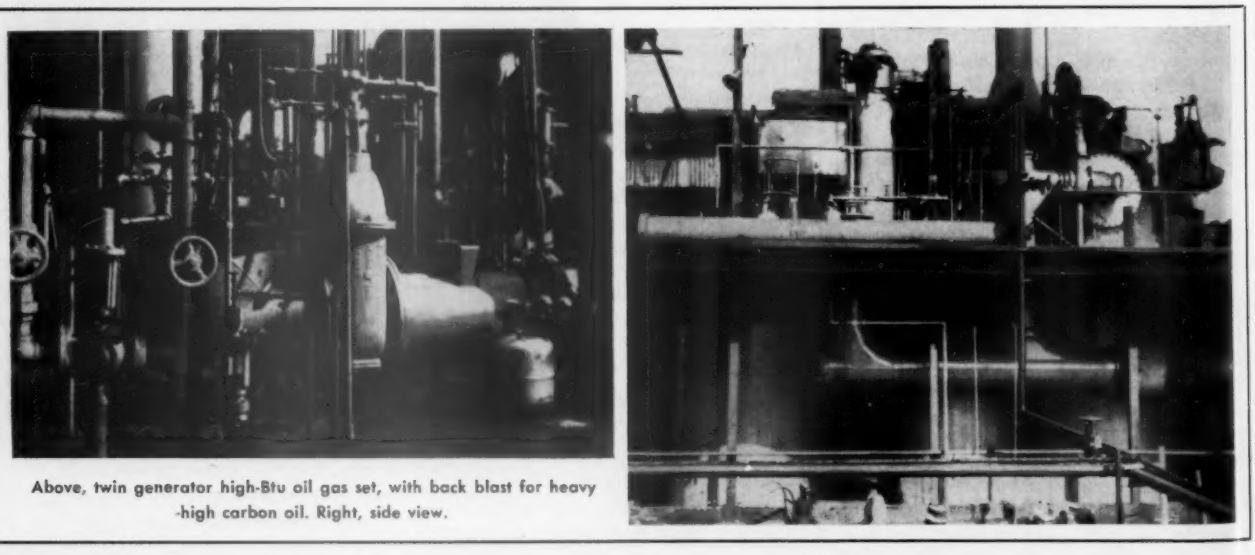
The decision was to adopt 1,000 Btu oil gas. Early in 1950, contracts were placed for the following main items of equipment and services:

Two twin generator oil gas sets with back blast for heavy oil.
Oil supply system.
Tar and liquor separator.
Two direct contact cooling scrubbers.
Light oil recovery system.
Storage tanks.
Conversion of appliances from 540 to 1,000 Btu.

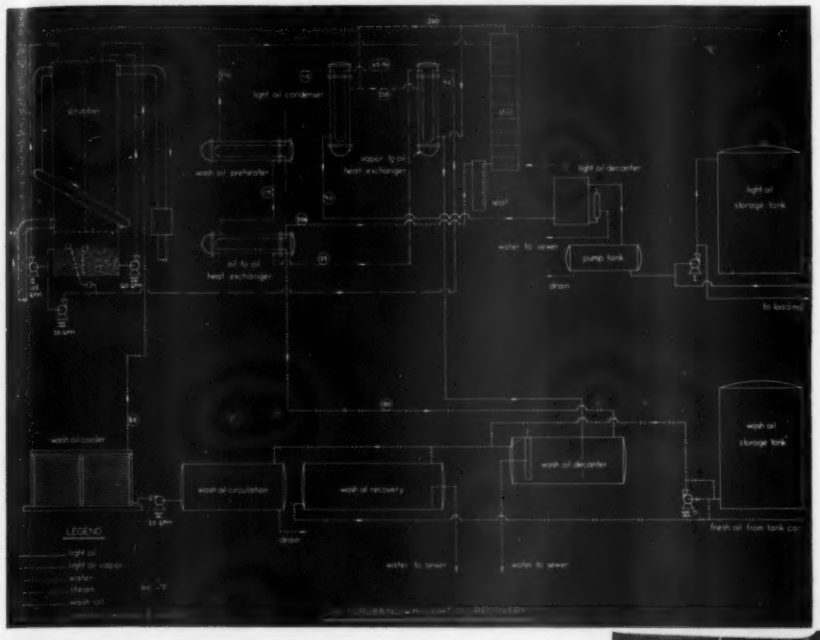
Operation started in 1950

Oil gas was first produced on September 6, 1950. Initially we sent out an oil gas-air mixture of 575 Btu, 0.85 sp. gr. which proved to be a satisfactory substitute for the 540 Btu gas on which the appliances were adjusted. Historically, the 540 Btu gas had been composed largely of water gas, but with some coal gas and, occasionally, propane-air. With varying composition, the specific gravity had ranged from .65 to .80.

To carry out our plan and gain full advantage of thermal capacity, all appliances were converted to a 970 Btu basis.

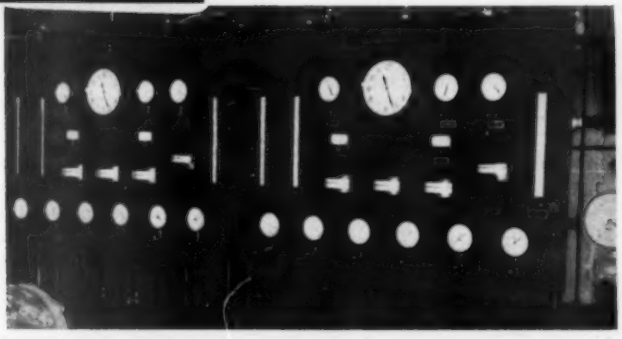


Above, twin generator high-Btu oil gas set, with back blast for heavy -high carbon oil. Right, side view.



Process diagram for oil scrubbing with light oil recovery. Installation of The Gas Machinery Co. equipment at Columbia plant of The South Carolina Electric & Gas Co.

Control boards for the two twin generator oil gas sets at Columbia, S. C.



This was completed smoothly under the supervision of Mr. C. B. Farrell.

In its entirety, the remodeled plant has worked well from the beginning. Results have been amazingly uniform and operations trouble-free.

It was not long before our new production capacity received a good test. In November, 1950, the area surrounding Columbia experienced weather which was unusually severe for this part of the country. In fact, the 16°F temperature and high winds would have taxed many a northern gas system. What we encountered was a load 42% greater than any previous peak. We met the demand fully, although only one of the two oil gas sets had been completed and placed in service.

Now, we have successfully passed two more winter seasons. Results have been so favorable and so consistent as to prove the oil gas operation beyond any doubt. Maintenance on the new and remodeled equipment has been moderate. We did have one bad time with the relief holder, but this was in no way related to the plant changes.

A very important feature of our plant is the light oil recovery system, which has been in continuous service since December, 1950. Designed by H. L. Moore, this oil scrubbing and light oil recovery system is illustrated in the accompanying flow diagram. The light oil equipment has been described in more detail in a paper presented at American Gas Association's production and chemical conference, May 1952.

For oil gas production, a heavy oil is employed, containing 6-to-7% Conradson carbon and being used both for the heat oil and make oil. It is believed that tar could be used as heat oil, but we have preferred to sell all the tar produced.

With production to date of approximately a billion cubic feet of 1,000 Btu oil gas, the average results per Mcf have been:

Total heat and make oil	13.4 gals.
Tar produced	2.6 gals.
Light oil recovered	0.8 gals.

Table 1

INDICATED SAVINGS—650 Btu and 1,000 Btu

	650 Btu One year	*650 Btu Four years*	*1,000 Btu One year*	*1,000 Btu Four years*
Production & distribution	$ 31,068†	$124,275	$ 39,964†	$159,757
Construction	291,000	291,000	459,400	459,400
	$322,068	$415,275	$499,364	$619,157

* $50,000 in plant changes would be scrapped in the event of a change from 650 to 1,000 Btu gas.

† These deductions were made:
12% carrying charges
Amortization of conversion charges, 10 years
Reduction in revenue due to fuel clause reduction
Tax 40%

ANALYSIS OF SEND-OUT GAS
By percent

Nitrogen	13.6
Carbon Monoxide	0.0
Carbon Dioxide	3.1
Hydrogen	16.9
Methane	37.9
Ethane	3.3
Propane	0.4
Ethylene	18.9
Propylene	3.2
C_4	0.4
1, 3 Butadiene	1.1
Cyclopentadiene	0.2
Acetylene	0.4
Benzene	0.6
Toluene	Trace
Total	100.0

(Continued on page 38)

PCGA Celebrates Diamond Jubilee

Tradition came to life—and to light at the Diamond Jubilee convention of the Pacific Coast Gas Association held at San Francisco, Calif., from September 9 to September 11.

This was also the one hundredth anniversary of gas service on the Pacific Coast—and the delegates and their companions joyfully entered into the spirit of the occasion.

Gas lights were lighted with due ceremony.

The convention also paid due respect to the past and the glory of one hundred years of public service by giving proper consideration to the problems of the present and the future.

Nearly one thousand persons attended this celebration of one hundred years of gas service on the coast and sixty years of association service by Pacific Coast Gas Association.

Although certain ceremonies were gay—and properly so—the business of the convention was directed toward giving better service to the constantly increasing population.

"The Association and the gas industry have not grown to their present stature by reason of a few spectacular accomplishments. Rather they have grown because of the hard work of thousands over the years, each adding his bit to the growth of the industry, to the improvement of its service, to the betterment of its public acceptance."

"Here, in California, the utilities at the first of the year had a capacity to receive 805,000,000 cubic feet per day of out-of-state gas. By the end of 1953, they will have a capacity in operation or under construction of 1,405,000,000 cubic feet per day. This will equal 75% of the total gas consumption within the state whereas, six years ago, we had no imports. These imports are the equivalent of 250,000 barrels of oil a day or one-quarter of California's oil production. By releasing a substantial part of this production for use elsewhere, the importation of gas is an important contribution to our defense effort and our national economy."

Raymond W. White, manager of the claims and safety department of Pacific Gas and Electric Co., talked frankly to the convention on the fact that "the price of safety is less than the cost of accidents."

In his introduction he said:

"If each person in this room today could accompany a claims or safety representative of a large corporation for a few months and see, as he does, the parade of injured persons—employees and third parties alike—visit the injured in the hospitals, visit the morgue to inspect the deceased, talk to the relatives of the deceased, review the reports of the tragic occurrences, look at the pictures included with such reports, and perform the other routine services which claims and safety departments perform in a large organization, each of you would automatically become an active crusader in the field of accident prevention."

Another point made by Mr. White was that experience has indicated that an almost certain aftermath of accidents is the "enactment of retaliatory or punitive legislation designed to accomplish a reduction in accidents, and, generally, these go much farther than is necessary —to the extent of seriously hampering an industry's activities, causing additional expense and slowing up of work."

Frank C. Smith, president of the American Gas Association, and president of the Houston Natural Gas Corporation, gave an all-embracing talk on the immediate problems of the industry. In discussing one aspect of the future he said:

"Our Gas Industry Development Program is dedicated in part to the proposition that, in its household uses, the gas load can be maintained and extended to all gas appliances. Some have thought that a great segment of our utility industry—the combination gas and electric companies in all parts of the country—constitutes a factor which makes this goal an impossible one; that, in other words, we have in our own household elements of difference which we cannot overcome. Let me say to you that this is not true.

On the contrary, no element of our industry is more conscious of the unique value of gas as a household servant than the combination companies, and among many of them we find the highest percentage of gas use in cooking and water heating. I have never yet found a combination company insensitive to the desirability of obtaining the maximum service and return from its investment in gas properties (except for refrigeration in some cases) where there is an honest difference of opinion, there is practically 100 per cent unanimity."

"Better living for the people we serve, and increased net income and greater stability to the corporate interests that are our responsibility," was the final phrase of a speech by Dean H. Mitchell, President, Northern Indiana Public Service Co., who also discussed the plans of the gas industry development committee. He said:

"I am often asked while on trips for the gas industry development program how we maintain dealer interest with such an intensive company sales program. I am thoroughly convinced, after many years of doing so, that a gas utility can carry on an aggressive, direct sales activity without encountering friction with the dealers, provided a proper code of ethics is maintained, and tangible, effective assistance is rendered by the utility to the dealer group."

Mr. Mitchell said that such a code of ethics must include:

(1) The establishment and maintenance of a markup which is sufficient to profitably market gas appliances.

(2) A conservative trade-in policy.

(3) Ads that assist dealers as much as they help us.

(4) The adherence to terms that are generally accepted.

(5) The availability to the dealer of financing plans that are approximately, if not the same as, those obtained by the company.

James F. Donnelly, president of the Gas Appliance Manufacturers Association, continued the discussion on the gas industry development program. He said:

"With government buying less, business and industry must turn to the public to maintain volume. In the period which lies ahead, employees are going to produce more work, and work of better quality. Competition for our market will be stepped up to a tempo which we have not seen in years. To attain our desired volume will require aggressive selling, new merchandising ideas, new territories, and an entirely new range of prices.

"So, the action program for gas industry development is economically sound. It has been conceived in conformity with the industrial concept for the future. It makes good sense because it equips us for competition in both the development of our products and in the method which we employ to present our products to the public.

"In short, it is geared to the highly competitive markets which are bound to come. This program has reviewed the past, so that we can evaluate the present, and thus, map our future."

Mr. Donnelly also talked on the subject of public relations. Among other things he said:

"Our public relations program has had a stormy existence since its inception a few years ago, but let's be objective about it. The program has reached a point of tremendous impact. It is bringing results. And it is worrying our competition.

The 100th anniversary of the gas industry on the West Coast was commemorated during the recent convention of Pacific Coast Gas Association, as President and Mrs. Moulton ride in a carriage of another day. Left, W. C. Mainwaring, vice president, British Columbia Electric Co., was elected president of PCGA during the convention.

"While we are being objective, let's also be frank. Many of us have been opposed to a national public relations program. Many others have said, 'This program is a wonderful thing, but it's a luxury that we can't afford.' A luxury? The sales of gas appliances and equipment bring in about $1½ billion to the retailers of our products each year. The annual cost of our public relations program is $180,000. Let's try a little simple arithmetic.

"If we relate $180,000 the annual cost of our public relations program to $1½ billion, the estimated annual retail value of our appliances, the cost for maintaining our public relations program is 1/80th of 1 per cent of our retail value. In other words, this public relations program should be looked at as requiring only 12 cents out of each $1,000 of our retail sales.

"So the answer to the question, "Is our public relations program a luxury?" is a definite: No. . . . The question should be, "Can we afford *not* to spend 1/80th of 1 per cent to maintain and advance the sales climate of a $1½ billion industry?" The question is also, "Can we afford *not* to spend 1/80th of 1 per cent to bring the story of gas appliances and gas fuel to the people whom we expect to buy our products?"

Walter G. Barlow, vice-president, Opinion Research Corporation, talked at the convention on opinion trends of the public and the employee, and resulting importance on business policy. In concluding his report on "yes or no" surveys, he said:

"Public organizations, administrative groups, colleges, business organizations, labor unions, all are gradually coming to the view that in today's era of complex and voluminous communications, interpretive effort is needed if people are to make intelligent and enlightened decisions and conclusions as citizens, customers, or voters.

"Ultimately the verdict on the free-market system will be rendered by the opinions of the people, the men and women in the cities and towns across the nation, where industry operates its offices and plants. The need for better understanding of the economy's needs and problems has been great in the past; it continues to be great."

Other remarks by Mr. Barlow are:

"American public opinion has swung further to the right in 1953 in favor of a business-like administration and against socialism and collectivism . . . surveys show that 78 per cent of the public approves of appointing outstanding leaders from business and industry to government posts, and 68 per cent believes such appointees will work for the good of the average man. . . . People are in favor of less government interference in labor-management disputes . . . 55 per cent said they would like to see more of such disputes settled by companies and unions, and 33 per cent favored government intervention."

"The home service woman knows better than anyone else what the consumer wants," was a portion of the message given the convention by Edith Ramsay, equipment editor, *The American Home*. In her prepared speech she said:

"Progress in designing home appliances can only be made if the manufacturer knows what the homemaker wants . . . home service women have a peculiar, first-hand understanding of the homemakers' problems . . . I earnestly believe that the clothes dryer as the bonanza of the appliance industry has been sold more through home service than anything else. It is the baby of the appliances that has walked before it crept, it is the appliance that home service girls need use but once to sell its merits to Mrs. Homemaker."

Officers elected to conduct the affairs of the Pacific Coast Gas Association for the coming year included: W. C. Mainwaring, British Columbia Electric Co., Vancouver, president; E. D. Sherwin, San Diego Gas & Electric Co., San Diego, vice-president; Harry McGann, Pacific Gas and Electric Co., San Francisco, treasurer; Clifford Johnstone, San Francisco, managing director and J. E. Kern, Los Angeles, assistant managing director.

The PCGA directors are:

A. R. Bailey, San Francisco
W. J. Bailey, Jr., Monrovia
A. E. Englebright, Honolulu
C. H. Gueffroy, Portland
W. M. Jacobs, Los Angeles
J. S. Moulton, San Francisco
J. D. Roberts, Salt Lake City
W. R. Smith, Sr., Los Angeles
F. B. Wright, Los Angeles

HONORS AWARDED AT PCGA CONVENTION

GOLD MEDAL to Robert W. Brooks, Pacific Gas and Electric Co., for his paper, "Specific Heat Data and the Compressor Plant", presented to the technical section.

HONORABLE MENTIONS to Elting Henderson, Southern California Gas Co., for his paper, "A Management View of Distribution Maintenance", presented to the technical section; and to N. K. Senatoroff, Southern Counties Gas Co., for his paper, "Elimination of a Reboiler in the Glycol Dehydration Plant", presented to the technical section.

BASFORD TROPHY to the sales and advertising section, R. D. MacMahon, Southern California Gas Co., general chairman.

SPECIAL COMMENDATION to P. T. Scollard, Southern California Gas Co., for his paper, "Application of Manpower Standards to the Mail Payment Processing Group", presented to the accounting section.

AGA Is St. Louis-Bound

WHEN Frank Smith hammers his gavel on the podium of the Kiel Auditorium in St. Louis on October 26th, the thirty-fifth annual convention of American Gas Association will be on its way through a series of general and specialized discussions relating to the future welfare of the gas industry.

Plans for the three-day convention include a number of new features as well as new approaches to old problems.

Realistically, the advance billing says, "It's not the weather but the competition that's hot—and getting hotter!" With that in mind three speakers at the "coats-off-for-action" luncheon plan to clear the air with respect to the position of gas in the fuel competition.

"Has gas got it?" is the question that James F. Oates, Jr. will discuss for an industry answer. Then, Dean H. Mitchell is going to put "both feet on the gas," in another emphatic airing of views. The title and the author-speaker would indicate that Lyle C. Harvey will have some plain things to say from the manufacturers' viewpoint as he goes through his coats-off lesson on "shadow boxing can't win."

The enhanced position in the public mind of gas appliances and gas as a fuel will be fully pictured in a general session by Gerry Swinehart as he tells the convention about the public relations activities of Gas Appliance Manufacturers Association.

OUTGOING AND INCOMING AGA OFFICERS

Frank C. Smith
Outgoing President
Houston, Texas

Earl H. Eacker
President
Boston, Massachusetts

F. M. Banks
1st vice pres.
Los Angeles, California

D. H. Mitchell
2d vice pres.
Hammond, Indiana

Each of the sections has its own program of subjects that relate to the interests of the groups. Upcoming president, E. H. Eacker, will tell the industrial and commercial gas section his views on how "sound selling creates sound customer relations."

A number of technical subjects dealing with recent advances in gas industry practices are on the program for the operating section. They include large volume measurement, electronics, automotive equipment, corrosion, and underground storage.

Speakers at the convention who come as guests of the gas industry will include the chairman of the Federal Power Commission, Jerome K. Kuykendall; Hines H. Baker, president, Humble Oil and Refining Co.; Eugene S. Loughlin, president, National Association of Railroad and Utilities Commissioners, and Professor Robert L. Dixon, director of public utility program, University of Michigan.

1953-54 NOMINATIONS FOR AMERICAN GAS ASSOCIATION OFFICERS—DIRECTORS—CHAIRMEN

OFFICERS

President: Earl H. Eacker, president, Boston Consolidated Gas Co.

First vice president: F. M. Banks, president and general manager, Southern California Gas Co.

Second vice president: Dean H. Mitchell, president, Northern Indiana P. S. Co.

Treasurer: Vincent T. Miles, treasurer, Long Island Lighting Co.

DIRECTORS

M. A. Abernathy, vice president, United Gas Pipeline Co.

B. C. Adams, president, Gas Service Co.

L. L. Baxter, president, Arkansas Western Gas Co.

Frank Austin Brownie, president, The Canadian Western Natural Gas Co., Ltd.

Sheldon Coleman, president, The Coleman Co., Inc.

H. C. Cummins, first vice president, Northern States Power Co.

J. F. Donnelly, vice president in charge of sales, Servel, Inc.

John E. Heyke, Jr., vice president, The Brooklyn Union Gas Co.

J. K. Horton, president, Pacific Public Service Co.

D. E. Karn, president, Consumers Power Co.

W. H. Ligon, president, Nashville Gas Co.

A. W. Lundstrum, president, Ohio Fuel Gas Co.

F. T. Parks, vice president in charge of operations, Public Service Co. of Colorado.

L. B. Richards, vice president, Harrisburg Gas Division, The United Gas Improvement Co.

J Theodore Wolfe, executive vice president, Consolidated Gas Electric Light and Power Co.

SECTION CHAIRMEN

Accounting: Paul E. Ewers, commercial office manager, Michigan Consolidated Gas Co.

Industrial and Commercial: Charles C. Eeles, district industrial sales manager, The Ohio Fuel Gas Co.

Operating: Frederick J. Pfluke, superintendent of gas operations, Rochester Gas & Electric Corp.

Residential: Raymond Little, general sales manager, Equitable Gas Co.

General Management: Lovett C. Peters, financial vice president, Laclede Gas Co.

Nominees will be voted upon by the membership at the 1953 AGA annual convention. The general nominating committee presenting the slate was elected at the 1952 convention. It comprises: F. A. Lydecker, Public Service Electric & Gas Co., chairman; James S. Moulton, Pacific Gas & Electric Co.; Robert E. Ramsay, New Haven Gas Light Co.; Willard F. Rockwell, Jr., Rockwell Manufacturing Co.; Harry K. Wrench, Minneapolis Gas Co.; C. H. Zachry, Southern Union Gas Co., and H. Carl Wolf, AGA, secretary.

Bond Market Improving Rapidly

But Share Prices Leave Much to be Desired

by John F. Falvey
Financial Editor

John F. Falvey

THE bond market has taken a more abrupt and promising turn-about than even its most ardent adherents believed possible a few scant weeks ago. The rally in Government bonds and the much better acceptance of prime and sound grade corporates at lowering interest cost reflect a variety of developments. No longer does the Treasury seem bent on marketing long-term bonds in open-market competition with corporations. The Federal Reserve seems to have abandoned its policy of having the Treasury go into the market for funds without the support of the central banking system. And last but not least, stretch-outs in business indicate that corporate demand for funds over the months immediately ahead may be less pressing than heretofore anticipated.

In one recent week alone the reserve banks purchased $50 million of Treasury bills and took up an additional $31 million under repurchase agreements. Further action along this line might be looked for as a means of offsetting deflationary developments affecting the bond market. In offering one-year and 3½-year paper in exchange for the $7,986 million of bonds which matured on September 15, last, the Treasury gave concrete evidence that it has reverted to its previous practice of adjusting its new offerings to what it expects the market to be able to bear.

While the stretch-out of maturities was a comparatively short one, the financing was a step in the right direction. Holders of the maturing bonds took down approximately $3 billion—39%—in new 3½-year 2⅞% notes, this being double the best previous attempt to move maturing Government issues into longer term maturities. The success of this offering stands out in bold contrast to the ill-fated previous attempt to extend maturities last February, when only $620 million out of $8.1 billion of maturing one-year certificates were exchanged for six-year bonds.

From all present indications, bond prices from this point forward should be affected chiefly by private demands for funds, with the two principal determinants being corporate expenditures for new plant and equipment and the progress of new housing starts. According to estimates made by the Department of Commerce, industrial capital expenditures will turn downward in the closing quarter of 1953 after their protracted rise.

Capital expenditures in the current quarter are estimated at $7 billion, down about 5% from the third quarter's $7.4 billion, to bring full year capital outlays to $27.8 billion—up 5% from 1952.

New housing starts have been trending lower during recent months. If the cautious prediction on capital expenditures is borne out and housing starts continue downward, the result should be a smaller volume of business borrowing and mortgage financing in 1954.

Since the Government policy now is to adhere to a mildly restrictive credit policy in boom business times and toward easing credit if the need arises, a further drop in housing starts and lower corporate expenditures for plant and equipment is expected to at least continue, and possibly accelerate, the recovery in bond prices recently in evidence.

Another factor expected to contribute to further upward movement in bond prices and lowering of long-term interest rates is the sharp increase which recently has been witnessed in personal savings. In the first seven months of 1953 they reached a record high volume of $284 billion—nearly $20 billion ahead of the identical 1952 period. Full-year 1953 volume is expected to exceed with a comfortable margin the $269.7 billion total recorded calendar 1952.

From all present indications corporate management may have very little success for some months in obtaining insurance company money with which to finance plant additions and improvements. Insurance company lending officers state that their money situation is very tight, as tight as it ever has been. In a number of instances these institutions are committed on their new money flow through the middle of 1954, and will not have any money to lend for plant expansion until July 1 at the earliest.

It might be said in this respect, however, that the situation could ease quickly with a couple of points further gain in market quotations for United States Treasury bonds. This would permit the insurance companies to dispose

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INDEX OF YIELDS : SELECTED UTILITIES STOCKS

	Sept. 1953	Aug. 1953	July 1953	June 1953	May 1953	Apr. 1953	Mar. 1953	Feb. 1953	Jan. 1953	Dec. 1952	Nov. 1952	Oct. 1952
Natural Gas Transmission Companies	4.90%	4.46%	4.76%	4.72%	4.34%	4.18%	4.04%	3.95%	4.04%	4.04%	4.14%	4.48%
Natural Gas Transmission & Distribution Companies	5.74	5.13	5.41	5.55	5.28	5.06	4.91	4.91	5.02	4.99	5.14	5.47
Manufactured & Mixed Gas Companies	5.14	4.99	5.06	5.08	4.80	4.73	4.63	4.65	4.87	4.83	5.00	5.04
Class "A" Electric Companies	5.41	5.27	5.41	5.53	5.18	5.14	4.97	5.05	5.08	5.10	5.20	5.40
Class "B" Electric Companies	5.61	5.50	5.41	5.68	5.35	5.06	4.93	5.08	5.19	5.08	5.19	5.47

This is a straight arithmetical index of comparative yields obtainable on a selected group of gas and electric utility industry common stocks.

The companies comprising this index have been selected by the AMERICAN GAS JOURNAL as providing a representative cross-section of each industry, from the standpoint of geographical diversification and of the relative importance of the individual companies in their areas.

No effort has been made to weight the average to give effect to changes in capitalization or in dividend rates because the yields afforded on the issues reflect such changes. The index is designed to show the rate of return and not necessarily market movements on the stocks comprising it.

This index is compiled from: natural gas transmission companies, 5; natural gas transmission and distribution companies, 5; manufactured and mixed gas companies, 4; class "A" electric companies, 4; class "B" electric companies, 5.

Dealers and Manufacturers Cautioned on Sales-Contract Entanglements

by Leo T. Parker
Attorney at Law
Cincinnati, Ohio

OBVIOUSLY, all manufacturers should avoid legal difficulties involving anti-trust laws. Both the Sherman Act and the Clayton Act have provisions for civil suits for damages by persons, as dealers, damaged or injured by violation of these laws.

"Any person who shall be injured in his business or property by reason of anything forbidden in the anti-trust laws may sue therefor in any district court of the United States in the district in which the defendant resides or is found or has an agent, without respect to the amount in controversy, and shall recover threefold the damages by him sustained, and the costs of suit, including a reasonable attorney's fee," 38 Stat. 731.

A few weeks ago a United States court rendered an important decision involving this law. In Fargo Glass & Paint Company v. Globe American Corporation, 201 Fed. (2d) 534, testimony showed that a manufacturer of gas ranges and a retail dealer signed a written contract by the terms of which the manufacturer gave the dealer an agency to sell its ranges in a named territory. Later the manufacturer cancelled this contract and made a contract with the Maytag Company, by which the manufacturer sold his entire output of ranges to the company. The retail dealer, whose contract the manufacturer had cancelled, sued the manufacturer for three times the amount of damages sustained by him as a result of what he claimed to be a violation of the anti-trust laws when the manufacturer sold his entire output to the Maytag Company.

The dealer proved that the Maytag Company made a net profit from the sale of ranges in the restricted territory amounting to $39,560.36. In view of the fact that the dealer argued that this profit was made by the Maytag Company in the same territory for which the manufacturer had cancelled his agency contract, the lower court entered judgment for the dealer for three times that amount and held $30,000.00 reasonable allowable attorney's fee. In other words, the lower court, including the lawyer's fees, held the manufacturer liable to the retail dealer whose agency contract the manufacturer had cancelled for the amount of $69,560.36.

The manufacturer appealed to a higher court which reversed the verdict, saying:

"The profits made by Maytag are not the proper measure of plaintiff's (dealer's) damages. There is no evidence to justify the assumption that plaintiff (dealer) would have sold the same number of Globe ranges that Maytag sold, or that it would have realized the same profit on sales it made."

Finally, the Court decided that the manufacturer had not violated any anti-trust law. In this respect, the court said: "In determining whether a contract to sell the entire output of an industrial plant to another, or a contract to purchase the entire requirements of a business of another violates anti-trust laws there is to be taken into consideration the effect and purpose of the contract. Where such a contract has for its object a legitimate purpose, and it only incidentally stifles trade, it is not within the inhibition of the statute. We are of opinion that under the facts and circumstances disclosed in this record the contract and arrangements between Globe and Maytag did not violate the Sherman Act or the Clayton Act."

Public service commission power

A reader asked the question: "Can a public service commission vary or revise a contract between a gas company and a municipality?"

The answer is, yes, if an emergency exists which may affect the health, safety, and welfare of gas consumers. See City of Akron v. Public Utilities Commission, 78 N. E. (2d) 890. This court held that the Public Utilities Commission has proper and legal jurisdiction to adopt emergency rules which vary or revise terms of a contract previously entered into by a municipality and a public utility for delivery of gas to be furnished to the residents of the municipality.

In this case testimony showed that domestic users of gas had insufficient supplies of gas. The Commission adopted an emergency rule which provided that no gas company shall supply gas service for space heating that "replaces other fuels." The court upheld the validity of this rule, and said:

"The principle seems well established that when . . . the subject of the contract is one which affects the safety and welfare of the public, such contracts are held to be within the supervising power and control of the Legislature to protect the public safety, health and morals."

What is negligence?

Recently a reader wrote: "Please give a legal rule as to what employees of gas companies should not do when turning on gas in a dwelling, to be certain the company will not be liable in damages for a subsequent explosion."

A leading court decision in Scarborough v. Central Arizona Light & Power Company, 117 Pac., (2d) 487, has established important law:

(1) If a gas company employee turns gas into a meter when he has actual knowledge, or reasonable ground to believe, that the house fixtures are defective, he is legally negligent and the company is liable for resultant damages; (2) if the employee knows that a gas meter, or pipes, leak and gas may escape into the premises, the company is always liable in damages to the occupants of the premises where the employee was directed to turn on the gas; (3) if the company's employee has no actual knowledge that the meter, pipes, or accessories which are under control of the occupant of the premises, are defective, the company's employee is under no obligation to make an inspection of such pipes and fixtures before nor after he turns on the gas, and the company is not liable for a later explosion of gas.

In the above court case testimony proved that a gas company's employee turned on the gas at a meter outside a house without examining the condition of the gas pipes inside the house. Some of these pipes were uncapped which permitted gas to permeate the house. The occupants suffered severe injuries, resulting from an explosion, for which they sued the gas company for damages.

It is interesting to observe that this higher court refused to hold the gas company liable because the pipes and fixtures were owned by the property owner and were under his control. This court held that it is the duty of a property owner to inspect pipes, accessories, and fixtures under his control before ordering a gas company to turn on gas.

Don't violate sale contract

If either a seller or buyer violates any of the terms of a sale contract, the other party may sue and recover full damages. In other words, both the

(Continued on page 43)

FEDERAL POWER COMMISSION

Suspends Wholesale Rate Increases by TGT and 3 Utilities

The Commission issued orders suspending proposed wholesale natural gas rate increases, together totaling nearly $7,000,000 per year, by Tennessee Gas Transmission Co. and 3 of its customer companies. Separate hearings in each of the proceedings will be held next February in Washington.

All the increases were proposed to be made effective October 1.

Tennessee based its proposed higher rates primarily on increases in the costs of gas and labor. The three customer companies each said that their increases were necessary principally because of Tennessee's proposed higher rates.

Natural Gas Companies' Operating Revenues and Income—July 1953

Operating revenues of natural gas companies reporting to the Commission totaled $150,705,834 in July 1953, an increase of 27.4% over July 1952 receipts. For the 12 months ended July 31, 1953, revenues aggregated $2,196,758,079 or 21.8% higher than those received in the comparable 1952 months.

Gas utility operating income for July 1953, amounted to $14,541,188, up 24.9% from the report for July of last year. For the 12 months ended July 1953, gas utility operating income was $311,130,441, representing an increase of 16.2% over the comparable period ended in July 1952.

Net gas utility plant of the reporting companies aggregated $5,239,945,994 on July 31, 1953, up 11.0% over a year ago.

Gas operating revenue deductions during July 1953, amounted to $136,324,860, an increase of 27.6%. Of this total, operating expenses accounted for $107,756,891; depreciation for $14,313,784, and taxes for $14,254,185.

Gas sales to ultimate consumers during the month were 196,762 MMcf, an increase of 16.4% over July 1952.

Sales to residential, commercial and industrial consumers increased 5.0%, 6.9%, and 19.8%, respectively, while revenues from the three classes of service increased 11.1%, 14.0% and 32.8%, respectively. Revenues from all sales to ultimate consumers increased 23.4% and amounted to $58,918,582.

Net income of the companies for July 1953, was $7,384,197, up 41.3% from the July 1952 net. For the 12 months ended July 1953, net income of $224,722,931 represented an increase of 11.9% over the comparable period ended July 1952.

Trans-Canada's Plea Denied

An application by Trans-Canada Pipe Lines Ltd. for rehearing of the Commissions opinion and order issued September 1 was denied. The opinion and order authorized Tennessee Gas Transmission Co. and Niagara Gas Transmission Ltd. to export natural gas from the United States for ultimate consumption in the Toronto, Ontario, market area.

In denying the two requests, the Commission said that they raised substantially the same issues as presented by Trans-Canada in an earlier brief and at the oral argument on Tennessee's application. The Commission declared that these issues were fully considered in its September 1 opinion, "and the desirability of re-argument thereon is not apparent especially in view of the necessity for final determination of the entire matter."

PSCo of North Carolina Okayed for Additional Facilities

A decision filed by a Commission presiding examiner issuing a certificate to Public Service Company of North Carolina, Inc., for natural gas pipeline facilities connecting the company's presently authorized system with local distribution systems in 25 communities in North Carolina. The decision is subject to review by the Commission, either upon appeal by parties to the proceeding within 20 days or upon the FPC's own motion within 10 days thereafter. If no review is initiated, the decision will become effective at the end of this 30-day period.

The facilities include a number of interconnecting lines used to supply natural gas in North Carolina localities.

The Commission authorized the company to construct and operate laterals for the transportation of natural gas supplied by Transcontinental Gas Pipe Line Corporation, and allocated 16,385 Mcf per day for distribution in 34 communities. Service to 9 of these communities has already been certificated, and the facilities authorized by the recent decision relate to entending distribution to the remaining 25 communities.

Colorado Interstate Wholesale Rate Increases Suspended

The Commission suspended, pending hearing and decision, proposed wholesale natural gas rate increases by Colorado Interstate Gas Co. and one of its wholesale customers, Colorado-Wyoming Gas Co.

Hearings will commence January 12 in Washington, D. C., on Colorado Interstate's proposed increase, and January 20 on Colorado-Wyoming's. Both companies had proposed to make their increased rates effective October 3.

Colorado Interstate's proposed systemwide increase totals about $6,508,000 annually based on the test year ending May 31, 1953. Colorado-Wyoming's would amount to approximately $473,500, based on anticipated sales during 1953. Colorado-Wyoming based its increase primarily on the proposed higher cost of gas purchased from Colorado Interstate.

The Commission said that Colorado Interstate's proposed increase is based, in part, on gas purchase costs and other expenses of operation which will not be effective at the proposed effective date of the new rates. The FPC also said that apparently the claimed rate of return, the allocation of costs between jurisdictional and non-jurisdictional sales, the allocation of costs in gasoline operations, and computations of federal income taxes "may not be proper and may depart from the principles announced" in an opinion issued August 8, 1952, directing Colorado Interstate to reduce its rates.

The FPC also denied Colorado Interstate's request to limit the period of suspension to three months, instead of five months allowed by the Natural Gas Act. If the proceedings have not been concluded prior to the expiration of the suspension period, the company may put the increase into effect under bond, subject to refund.

Settlement Gives TETCO $4,592,806 Annual Increase

The Commission has approved a settlement under which Texas Eastern Transmission Corp. will increase its wholesale natural gas rates by approximately $4,592,806 per year over those which it has been collecting under an interim settlement approved in November 1952.

The new rates, which affect about 40 utility companies along the route of Texas Eastern's pipeline system, will be effective as of September 1, 1953. The interim settlement, which became effective December 1, 1952, provided for an increase totaling $26,180,000 annually.

The settlement was reached at a series of conferences attended by representatives of Texas Eastern, customer companies and FPC staff.

In approving the settlement, the Commission said that on the basis of an extensive field examination of the books, records and operations of Texas Eastern, the FPC staff had computed a rate base for 1953 of $340,795,600. Allowing a 6% rate of return upon this base, the staff developed a cost of service of $147,465,400, based on estimated sales of 443,122,702 Mcf for 1953. This cost of service computation was presented to all parties to the proceeding in the conferences and an agreement was reached that rates which would yield revenues equivalent to the cost of service, based on 1953 operations, would be fair and reasonable.

Texas Eastern's original rate increase filed in 1952 was for $41,800,000. The settlement effected reduces the increase actually made to a total of $30,772,806.

The Commission's approval of the final settlement is subject to several conditions. These include, among others, a requirement that Texas Eastern distribute among its customers any money which it may receive in refund if the Texas gas gathering tax is held invalid by final court judgment. Also, that Texas Eastern must treat any future tax savings resulting from accelerated amortization in the same manner as may be specified by the Commission, or a court in final judgment, in a pending proceeding involving a proposed rate increase by Panhandle Eastern Pipe Line Company. If this should result in lower rates, Texas Eastern must refund to its customers any excess amounts previously collected if the new schedules are made effective retroactively.

Natural of America Wants to Up Rates $7,200,000

Natural Gas Pipe Line Co. has filed a proposed $7,200,000, or 21½%, annual wholesale natural gas rate increase.

The increase would affect 18 customer companies in Kansas, Illinois, including the Chicago area, Indiana and Wisconsin. The company proposes to make the new rates effective November 13. The $7,200,000 increase would be over and above rates which the company is now collecting under bond, subject to refund.

Natural said that the primary reason for the higher rates is to meet increases in the cost of gas purchased from Colorado Interstate Gas Company, Texas Illinois Natural Gas Pipeline Company, and others. The company also said that the proposed increase would enable it to earn a 6½ percent rate of return.

Six Rate Increases Suspended

The Commission has suspended proposed wholesale natural gas rate increases, together totaling nearly $3,000,000 per year, filed by 4 subsidiaries of The Columbia Gas System, Inc., and 2 other pipeline companies which purchase natural gas from one of these Columbia companies.

The actions involve United Fuel Gas Co., Atlantic Seaboard Corp., Virginia Gas Transmission Co., and Central Kentucky Natural Gas Co., all Columbia subsidiaries. Also, Commonwealth Natural Gas Corp. and Roanoke Pipe Line Co. Atlantic, Virginia and Central Kentucky purchase gas from United Fuel; Commonwealth and Roanoke buy gas from Virginia.

All the companies had proposed to make their increased rates effective October 1. Since the filings were made on September 14, none of the increases could have gone into effect until October 15, unless otherwise ordered by the Commission, because the Natural Gas Act requires 30 days' public notice of any change in rates. The 5-month suspension period will extend until March 15 in each of the proceedings.

United Fuel's proposed increase, totaling about $2,200,000 per year, would affect 5 customer companies in Kentucky, Ohio and West Virginia. United Fuel said that its increase was required primarily because of higher rates proposed by its supplier, Tennessee Gas Transmission Co. FPC pointed out that Tennessee's proposed increase was suspended by an order issued September 24.

Hope Files Proposed $2,105,000 Wholesale Increase

A proposed $2,100,000, or 5.7%, annual wholesale natural gas rate increase has been filed by Hope Natural Gas Co.

The increase, which the company proposed to make effective November 9, would affect East Ohio Gas Co., Peoples Natural Gas Co., New York State Natural Gas Corp., River Gas Co., Manufacturers Light and Heat Co., and Mount Morris Gas Co.

Hope said that the proposed increase is necessary due to the increased cost of both produced and purchased gas, and to provide a higher rate of return, 6¾% required to maintain credit and attract capital needed in operations.

The proposed increase is in addition to two others which are now under FPC suspension.

Cities Service Gets Facilities Okay

A certificate has been issued to Cities Service Gas Company authorizing it to construct an extension to its pipeline system to attach additional supplies of natural gas in the Golden Trend area of central Oklahoma.

Cities Service will build a total of 69 miles of pipe and install one 1,100 horsepower unit at an existing compressor station. The project will consist of 44 miles of 20-inch and 25 miles of 16-inch line. Total estimated cost of the construction is $3,002,700.

The Commission said that data submitted by Cities Service indicates that approximately 40,450 Mcf of additional gas per day will be available to the company in 1953 from the Golden Trend area upon completion of the new facilities.

Suspended Increases by Southern Natural go into Effect

The Commission has issued orders making effective, under bond and subject to refund, the suspended wholesale natural gas rate increase by Southern Natural Gas Co. totaling about $3,168,000 per year. It affects about 52 utility customers in Mississippi, Alabama and Georgia.

Examiner Permits Ark-La to Abandon Service to Mississippi River

The presiding examiner of the Commission filed a decision, subject to review by the Commission, permitting Arkansas Louisiana Gas Co. to abandon the natural gas service of about 12,500 Mcf per day to Mississippi River Fuel Corp.

The examiner said that the load growth on Arkansas Louisiana's system and increased demands of large industrial customers have created a market for the 12,500 Mcf now sold to Mississippi. He found that the record supports conclusions by the FPC staff and Arkansas Louisiana that the discontinuance of the service would result in economic benefits to the applicant. Arkansas Louisiana would receive more return for the gas than Mississippi now pays and the availability of this gas to Arkansas Louisiana would tend to postpone requirements for increasing the capacity of its transmission system.

Trunkline Directed to Supply Central Illinois Public Service

A decision has been filed by a presiding examiner of the Commission directing Trunkline Gas Co. to supply a maximum of 2 million cubic feet of natural gas per day to Central Illinois Public Service Co.

The examiner said that no undue burden will be placed upon Trunkline in rendering the requested service to Central Illinois, and that the deliveries will not impair Trunkline's ability to render adequate service to its present customers. The decision requires Trunkline to establish the connection, estimated to cost $10,000, with Central Illinois' system.

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- *Natural Gas Conservation

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- *Reformed gas
- *Hi-Btu oil gas
- Interchangeability

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- *Sources, properties and uses

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- *Perfect gases
- Supercompressibility

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- *Competitive fuels, part 1
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American Gas Fundamentals *is a comprehensive compilation of basic gas facts to guide any gas utility employee toward a broader understanding of the industry as a whole.*

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Underground Storage of Natural Gas

THE committee on natural gas reserves of American Gas Association has defined underground storage of natural gas as "gas which has been transferred from its original location in a gas and/or oil field to another natural underground reservoir for the primary purpose of conservation, fuller utilization of pipeline capacities and more effective delivery to markets."

The history of underground storage of natural gas dates back to 1915 when it was used in Ontario, Canada. A few years later the states of New York and Kentucky had underground storage operations.

Now natural gas utilities are, in effect, warehousing gas. Most businesses dealing with seasonal sales of non-perishable products operate on the basis of year-round production in order to minimize capital investment in facilities.

Today, gas utilities, pipeline companies and even producers, faced on one hand with runaway demands for natural gas and on the other with mounting costs and pipeline shortages, have begun to invest heavily in underground storage as a means of both cutting operating expenses and selling more gas. A decade ago there was little need for such a warehousing program; the demand for natural gas as a space-heating fuel had not yet placed the gas industry in the uncomfortable position of handling peak loads in Winter and valley loads in Summer.

The sudden burst of popularity which resulted from World War II shortages of other fuels, combined with the availability of natural gas, brought the industry face-to-face with the serious problem of seasonal ups-and-downs in load factor.

The natural gas industry is working miracles in making molehills out of mountains with its underground storage program. With some companies equipped to take at least 50 per cent of peak-day sendout from underground storage reservoirs, distribution peaks are being levelled instead of merely shaved.

With the advent of long-distance, super-inch pipelines, and the runaway growth in demand for natural gas for space heating, underground storage has become a major operation of many gas utilities. The AGA committees on underground storage of gas and natural gas reserves reported that, as of December 31, 1952, 151 pools were in operation with about 673 billion cubic feet stored. Maximum day output was 4.1 billion cubic feet, and is fast approaching 5 billion.

Reasons for Underground Storage

The *perfect* situation for underground storage of natural gas is near large market areas. Gas is pumped into suitable subsurface formations or depleted gas fields during the Summer to be readily available when a quick drop in the thermometer overtaxes regular pipeline facilities.

Conservation is another factor in the storage of gas. Summer gas not needed by residential and commercial consumers generally has been sold at bargain prices to industries for use as boiler gas. Such gas is sold on interruptible contracts, providing for the industries to switch to stand-by facilities when Winter weather puts a heavy residential demand on gas supplies. Underground storage precludes the necessity for selling a premium fuel at low rates to do a lowly job.

Peak shaving is not the only advantage of underground storage, however. It also helps keep gas costs lower for consumers, while giving producers higher field prices, for utilities can buy gas on firm contracts at year-round prices.

It is quite obvious that there is a cost added to gas by virtue of its being stored. However, this cost is low compared to the cost if all the gas were transported through pipelines during peak periods. The AGA committee on underground storage estimates that there has been expended, as of December 31, 1952 about $264,311,000 on underground storage, which amount includes both the physical properties and the cushion gas. If pipelines were constructed to handle all the peak load gas, the capital expenditure would run into the billions of dollars and make the gas very expensive, indeed.

Since natural gas has a very important place in industry, it is highly advisable to have a sufficient supply of gas, at all times, to meet its requirements and thus prevent shutdowns. In certain of the industries—ceramics being an example—it is very important to have enough gas available so that plants will not be shut down suddenly, which, in addition to the loss of productive time, might cause loss of products that are in long-cycle heating processes. Uninterrupted gas delivery also means that labor will not be deprived of income due to plant closings for gas shortages. In many instances plants have stand-by fuel which can be used but, generally, not for extended periods. As a national defense measure it is very important to have adequate gas to keep production at the maximum.

Industries are important to natural gas utilities due to the fact that they provide an income during the Summer, or during off-peak periods, when the revenue from house heating, for example, is quite low.

Dump gas and interruptible contracts, at best, are not generally desirable for most natural gas utilities. This type of gas, because of its seasonal limitations, commands a relatively-low price. If the same gas could be sold through firm contracts it would have a much higher value and more selective usage. Underground storage gives gas a very desirable usage factor.

Where Gas Can Be Stored

In order to store gas underground, reservoirs must be selected carefully. They must be completely sealed by Nature to prevent the migration or escape of injected gas.

The reservoirs used are mainly porous and permeable segments of stratified rocks sealed by impervious surrounding rocks or another agent, such as water. They are generally sandstone or limestone formations originally

filled with natural gas or some fluid which, to a large extent, has been exhausted.

A gas storage field has two main functional uses: (1) to deliver at any time during the Winter demands, and (2) to deliver the seasonal volume necessary to supplement the supply of regular pipeline gas in order to meet the total Winter demand. These two factors must be considered first when selecting a storage area. It follows that the storage field must be situated reasonably near markets, compressing stations, and main transmission lines. Fields meeting these requirements are approaching the ideal, which is seldom realized; however, many storage projects now in use are very satisfactory if not ideal.

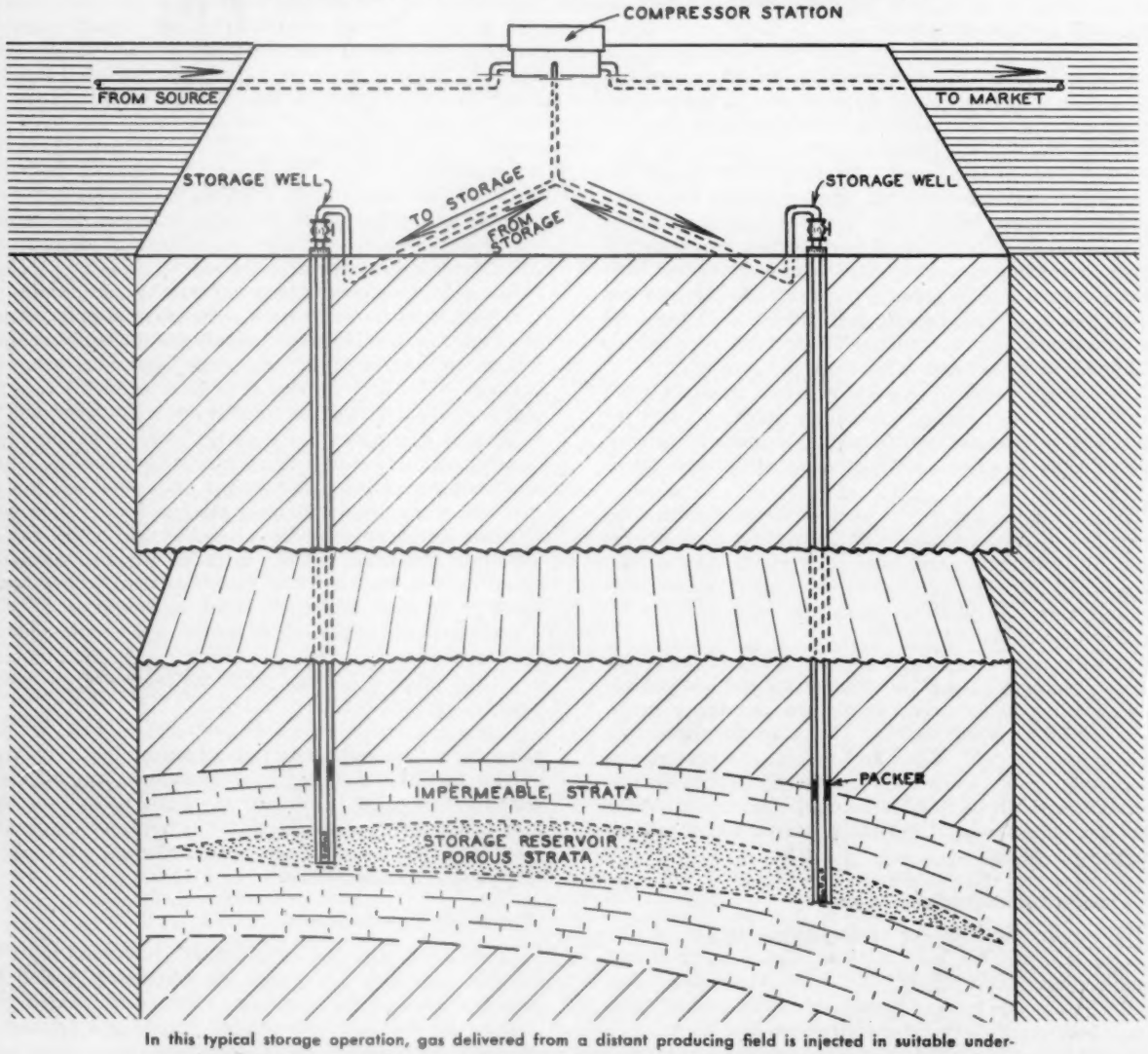
Conservation also has resulted from underground storage reservoirs near oil fields in the Southwest. For many years natural gas, which often is produced with oil, has been flared, or burned, at the fields for want of a market. Since this distress gas cannot be shut in, trillions of cubic feet of it have been wasted, in the past.

Reservoir Considerations

Next in importance to location, from the viewpoint of both economics and operations, is size. The most satisfactory reservoir is one that will yield gas readily and at a proper rate to meet daily peaks and is large enough to contain a total volume sufficient for the entire season. Daily rate and total Winter output, however, must not necessitate too great compression or too much cushion volume, the gas held in the reservoir at all times as a base volume to provide pressure. It can be visualized as stored energy. Without a cushion, made up of remaining native gas or injected gas, storage wells could not supply large deliveries at sufficient pressure.

Few fields meet all the ideal storage conditions, but many approach the requirements. Desirable features are: (1) high porosity and permeability in the reservoir rock, (2) depth sufficient to guarantee safety when the desired maximum amount of gas has been stored with its re-

OPERATIONAL DIAGRAM OF UNDERGROUND GAS STORAGE AREA



In this typical storage operation, gas delivered from a distant producing field is injected in suitable underground geological structures close to market areas, during periods of relatively low demand, to be stored for withdrawal when peak demands exceed the delivery capacities of long-distance transmission lines.

sulting high pressure, (3) either an absence of water or an easily controllable water condition in the reservoir, (4) a thick reservoir formation covering a relatively small surface acreage rather than a thin formation covering a large area, and (5) a formation free of oil. Although exhausted oil-producing formations have been used successfully as storage reservoirs, it is generally more satisfactory to store in one that does not contain oil, water or any other liquids that might interfere with storage operations. If the reservoir is definitely under hydraulic control, water in the formation can be used to advantage, however. In such cases the water not only acts as a seal, retaining the stored gas, but by slowly advancing as the gas is withdrawn, serves as a piston, maintaining the pressure to some extent.

A company is quite fortunate if it can find storage reservoirs both ideally located and having all the desirable features mentioned above. Because it is impossible to change the location of a prospective storage area or the natural characteristics of the reservoir, the problem becomes a complicated technical matter of selection.

A great many gas fields are too large, at least in the matter of total volume, for effective storage operations as it may be necessary to store a large gas cushion or downgrade the gas thus losing energy by reducing the pipeline pressure. Such fields may also lack the flexibility of operation necessary in handling storage gas. Although a field, to be used for storage, need not have been entirely exhausted of its native gas (it is usually better if some original gas remains as part of the cushion), at least a portion of the original gas must have been removed to make room for the gas to be stored.

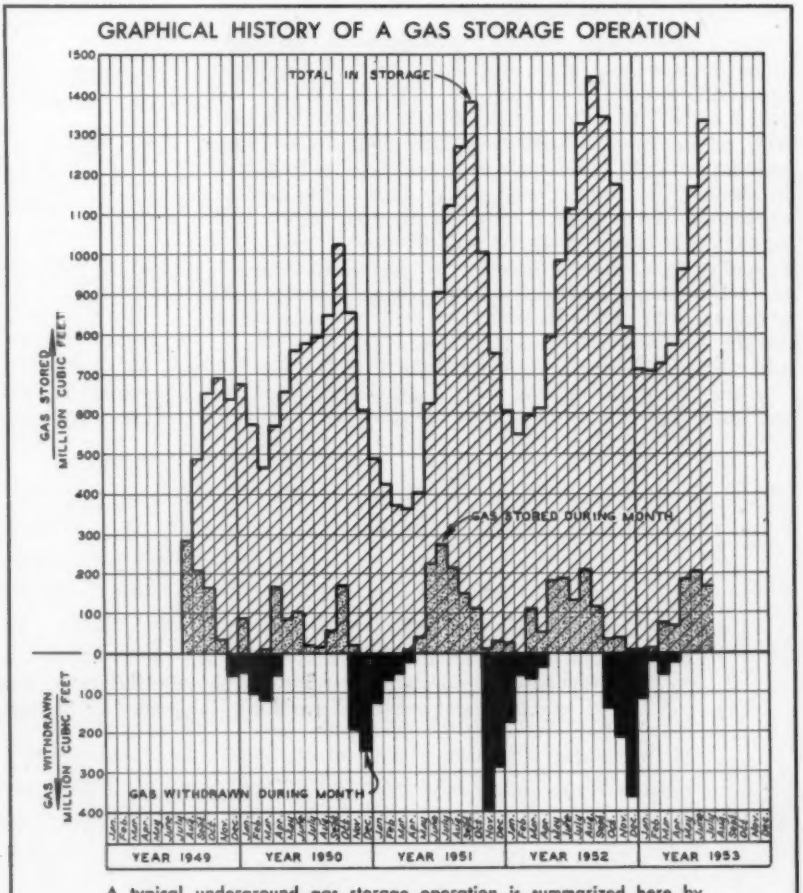
There is considerable doubt in the minds of many natural gas operators as to the wisdom of raising the reservoir pressure above the original. It is thought that this might force gas into less-porous sections of the formations from which recovery would be slower, or even cause serious damage to the reservoir formation by splitting it or forcing blowouts in geologic faults or zones of weakness. In some water flooding operations of oil reservoirs, pressures are exerted on the formations very materially higher than would be considered normal for the reservoir, considering its depth. It is reported that, when the pressure is very high, the reservoir rock sometimes separates. Great caution must be exercised and a careful study made of each reservoir, especially as to the type and strength of the equipment used in a storage area, before raising the pressure much higher than it was originally. The problems of increasing pressures is still in the conjectural stage. Additional experience and research must be carried out before a definite rule can be established and followed. In all probability, it will be found that each field must be treated on its own merits.

Mississippi River Fuel Corporation is experimenting with storage of natural gas in water-bearing formations on an anticline structure below a shallow limestone formation from which oil was formerly produced. The company reports that "while we have injected gas into the formations and have made some withdrawals, we have encountered gas leakage to the surface by reason of an abandoned improperly plugged deep well or fracturing of the strata overlying the proposed storage reservoir formations."

The Peoples Gas Light and Coke Company, Chicago, operates in an area where there are neither oil nor gas fields available for storage. The company is now constructing a storage area in an anticline formation containing a highly-porous, salt water-bearing sandstone stratum about 1,700 feet below the surface which presents an economic and practical storage area. Gas is being pumped into the porous rock, forcing back the water. The gas will be held under pressure like a bubble in the salt water.

How Fields are Acquired

A great many problems are involved in converting a gas field into a storage field. To begin with, practically all acreage included in the field was originally leased for the production of oil and gas, and not for the storage of gas. The ordinary oil or gas lease grants to the lessee the right to produce and remove those original substances underlying the lessor's property. Such a lease does not necessarily grant rights to any subsurface rock as a reservoir into



A typical underground gas storage operation is summarized here by month-to-month showings of the gas volumes that are injected in underground structures, withdrawn, and the net remaining in storage.

which gas may be injected, stored, and later removed. This means, then, that before storage operations can be inaugurated, storage contracts must be completed between the lessor and lessee. A great amount of time may be required for the legal work necessary in preparing and making such contracts. Any number of difficulties usually are encountered in these negotiations.

The geographical location and the areal extent of a field must be determined as the first step toward its acquisition for underground storage. After this, it is necessary to make a preliminary geological study of the area, with careful mapping of all drilling operations during the period of study.

The geologists must study (1) general geological factors, including the reservoir area, formation thickness, and geological structure; (2) the relationship of gas, oil and water to each other and position of their contacts; (3) the areal extent or perimeter of the reservoir is ascertained by the studies in relation to the farm line map showing surface ownership and the exact location of all productive wells and dry holes; (4) a preliminary study of the amount of gas the reservoir will hold, based on past production and rock pressures; (5) the approximate rate of deliverability based also on the records of past production. From these data—location, size, and other factors affecting the general conditions—a decision is reached as to whether or not the field meets the proper requirements for storage.

Preparing a Field for Gas Storage

The next step in activating a storage field is to recondition the wells and to see that the reservoir is free from any physical defects whereby gas might be lost. If the field is an old one, it is necessary to examine and, if necessary, rehabilitate the wells that have been drilled. This includes not only those wells active at the time storage is anticipated, but also those that have been abandoned. In the case of active wells, it is frequently advisable to pull the tubing or casing, clean the well thoroughly, and shoot or acidize the formation in order to increase its deliverability. New tubing and casing should be used and packed or cemented in such a manner as to make absolutely sure that the wells will withstand all pressures that they may be subjected to, as determined beforehand.

In the case of abandoned wells, improperly plugged or not sufficiently plugged to withstand the pressures required for storage operations, it is necessary to clean them and either make storage wells of them, or re-plug them using sufficient cement to make them absolutely free of leakage.

Because it is most important to know the exact positions of the effective porous parts of the formations constituting the reservoir section, it is advisable to obtain electric logs—in old fields preferably a gamma ray log—also a temperature survey and any other information that may be useful.

Once the old wells have been re-conditioned and new wells drilled, the storage of gas can be started. For all practical purposes it can be assumed that with the same differential in pressure, the rate at which gas can be injected into a storage reservoir is essentially the same as the delivery rate, all other factors being similar. An empirical review should be carried out for each reservoir in order to reach conclusions with all the accuracy that is possible.

It is quite obvious that in order to have a flexible storage operation, the necessary equipment and facilities, such as compressor stations and pipelines, must be installed. The kinds and sizes of equipment depend upon the volume of gas to be handled. In some cases, where gas is being stored from a main trunk line, the pressures are high enough to fill the storage area without additional compression but, generally, compressors are necessary either to inject the gas or to withdraw it, especially when the pressures are low in the storage reservoir.

It quite frequently happens that it requires several years to fill the storage reservoir to its ultimate capacity. This is due to the fact that as a portion of the gas stored each Summer must be used during the Winter, there is always more placed in storage than is taken out until the field reaches its maximum usage. This is graphically indicated by the chart on the preceding page, which is the actual operational record of a storage field now in use.

There is no definite rule that can be applied to the ratio of input-to-withdrawals, except that each field has its own characteristics which govern how much cushion gas should be maintained and the amount of inventory gas that is needed to supply the markets and take care of the heating seasons. In many instances the cushion gas represents at least half the gas in the storage reservoir when it is full, but this varies considerably from field to field.

This chapter on Underground Storage of Natural Gas was prepared by Ernest E. Roth, vice president and chief geologist, Columbia Gas System Service Corporation

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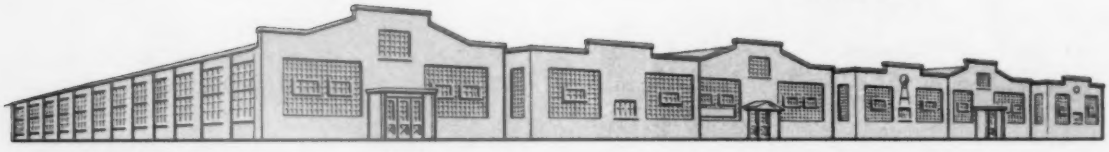
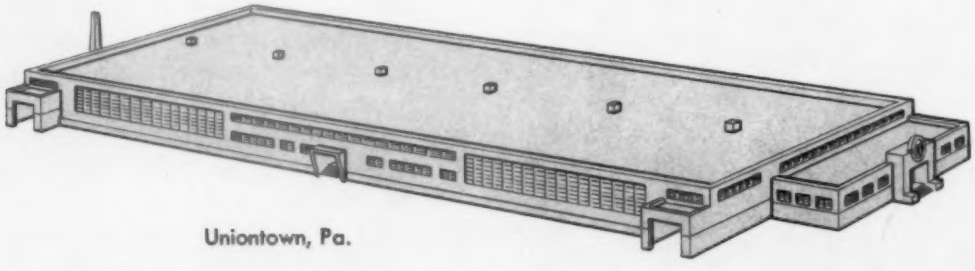
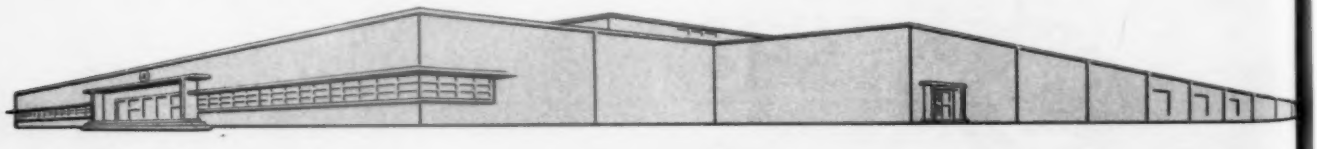




Uniontown, Pa.



Sulphur Springs, Texas

Growing Gas Business

NEW WAREHOUSES and Service Facilities

Our recently completed warehouse facilities in Kansas City, Atlanta, Oakland and Sulphur Springs are now providing superior service to all users of Rockwell products in these areas. For customer convenience we maintain here and at six other locations throughout the country complete warehouse stocks of Rockwell meters, regulators and Nordstrom valves. In many cases we can make overnight deliveries. Also, from well stocked bins and shelves we can furnish immediate service on repair parts orders. Further, most of our warehouses are equipped to do maintenance and repair work, thereby saving on freight to and from the factory. We invite equipment buyers to take full advantage of the "off-the-shelf" buying convenience and economy our extensive warehousing program makes possible.

Interior Views of New Rockwell Warehouses

Rockwell Warehouses are located at Atlanta, Boston, Chicago, Houston, Kansas City, Los Angeles, Oakland, Seattle, Sulphur Springs and Tulsa.

this, too, is **ROCKWELL** with . . .

Better Products for You

Here at Rockwell we are consistently seeking new ways to make better products, constantly adding to the Company's productive capacity, continually striving to increase our usefulness to the gas industry.

Aluminum Meters

Tin Meters

Cast Iron Meters

Pressed Steel Meters

Orifice Meters

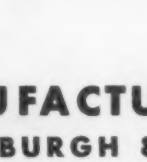
Service Regulators

Industrial Regulators

"1001" Regulators

Balanced Valve Regulators

Nordstrom Service Cock



Nordstrom Standard Valve

Nordstrom Hypreseal Valve

ROCKWELL MANUFACTURING COMPANY

PITTSBURGH 8, PA.

Atlanta · Boston · Chicago · Houston · Los Angeles
N. Kansas City · New York · Pittsburgh · San Francisco · Seattle · Tulsa

In Canada: Peacock Brothers, Limited

Capacity Credit Method for Gas System Cost Allocation

(Continued from page 17)

ever, when unused capacity created by firm customers is used by interruptible customers, an adequate charge must be made to them for such capacity, and equivalent credit must be given to firm customers. Capacity cost is assigned by this method in two steps.

First the capacity responsibility of firm customers is established by a modification of the so-called complete peak method. From the basic principle suggested by Cram and Robison, (Electrical World, 1928, Vol. 92, p. 359) and applied by them to one daily load curve only, the writer has developed a procedure permitting application to the annual load-duration-diagram, i.e. to load conditions throughout the whole year. For the application of this improved method, the complete peak is considered to comprise all days during which the system demand exceeds the average demand. Unused capacity is first assigned to the days making up the complete peak by the partial plant method first proposed by Lauriol (L'Eclairage Electrique, 1902, Vol. 33, p. 325), and is subsequently shared on each of these days among firm customers in proportion to the excess of their demand over their individual average. The justification for this procedure is the fact that only such excess contributes to formation of the complete peak. An essential refinement of the Capacity Credit Method consists in giving firm customers, using less than their average demand during the complete peak, credit for the capacity thus vacated by them. The offset of such credit is shared by the other firm customers, who are thus relieved of a substantial unused capacity charge during this day. This credit reserves to a customer, whose demand during off-peak periods exceeds his demand during peak periods, preferential treatment over a 100% load factor customer requiring full capacity throughout the year. The method differentiates among customers with more or less limited demand during complete peak, giving most credit to true off-peak customers.

The computation of unused capacity assignable to each day and its allocation to the different firm classes of business, has been adapted for performance on I.B.M. punch card machines. It requires only the transfer to punch cards of daily sales to the different classifications, available from company records. The machine computes and provides printed results in a few hours.

If only one firm service classification is to be considered, as against interruptible customers, all unused capacity has to be borne by it, obviating the necessity of allocation by the procedure just described. If there are two or more firm service classifications having the same load factor and load characteristics, i.e. coincidence of maximum demand and no diversity, allocation of unused capacity in proportion to used capacity will yield same results as the procedure outlined.

After the assignment of unused capacity to firm customers by this first step, the Capacity Credit Method charges, in a second step, used capacity to interruptible customers. Interruptible, and off-peak, customers have no definite capacity responsibility insofar as deliveries to them are controlled in such a way that they do not increase total system demand to create unused capacity and additional capacity cost. In consequence, they cannot be held responsible for unused capacity. These customers are using, however, capacity built to serve firm customers and should be required to contribute to cost of operating these facilities in proportion to capacity used by them, up to limit set by service value.

In charging interruptible customers with used capacity, the Capacity Credit Method requires that they be given the same credit privileges which are accorded to firm customers in initially assigning to them unused capacity, and described before as an essential characteristic of this method. Thus, for every full day during which deliveries to them are curtailed, interruptible customers must be given credit for the volume by which supplies to them on that day are below their average. Such credits, computed on the basis of equivalent full days of 100% curtailment, equal the average daily deliveries (annual sales divided by 365) times number of days of curtailment. Credits established by this method are subtracted from capacity used by interruptible customers, balance being used capacity charged to them.

If there are classes of interruptible customers whose supplies are subject to different degrees of curtailment, and credits are determined separately for each of them, the capacity charge decreases with increasing curtailment. A curtailment of 10% reduces the average capacity charge to 90% of the charge per Mcf made to a 100% load factor customer. A 25% curtailment reduces the charge to ¾ and a 50% curtailment to ½ of the unity capacity charge. The average capacity charge will continue to decrease and be, for instance, $^1/_{10}$ of unity for a customer whose curtailment is 90%.

Capacity used by interruptible customers is actually a part of the unused capacity initially assigned to firm customers. Used capacity charged to them, must go as a credit to firm customers, in proportion to unused capacity originally assigned to them.

In a case where the capacity of the system exceeds the maximum demand of the firm classes of service, and thus permits potentially interruptible sales, such interruptible supplies will not receive any credit and will be charged, in consequence, with used capacity at the unity rate like a 100% load factor customer. Since the firm customers have not been initially charged with any unused capacity for such excess of system capacity over firm demand, no credit must be given to them for capacity charged to these non-curtailed interruptible supplies. The firm customer will, however, be charged with the unused capacity created by them and not used by curtailed interruptible supplies.

Total capacity cost, including that of spare capacity, is shared among all classes of service in proportion to used and unused capacity chargeable to them, as determined by this method. For a gas distribution system, production capacity cost is assigned exactly as described, and distribution capacity cost by the same method, on the basis of hourly demands. A procedure of load analysis is available for the determination of daily and hourly demands of the different classes of service required for the application of the Capacity Credit Method.

When capacity cost, commodity cost and customer cost are allocated, there remains the general cost to be assigned. These expenses depend largely on the size of the enterprise and are not immediately and directly affected by the system capacity, the volume of gas sold, nor the number of customers. It is desirable, though not mandatory, that the different service classifications contribute to these expenses in proportion to the amount of business transacted with them. General cost is consequently assigned in proportion to the totals of capacity, commodity and customer cost allocated to the different service classes.

For a pipeline transmission system with an over-all average cost of slightly more than 32¢ per Mcf and having about 45% firm sales with a load factor of approximately 40%, and 55% interruptible sales with varying curtailment, this method results in average cost of about 40¢ per Mcf for firm customers, and 24 to 28¢ per Mcf for interruptible customers, depending on curtailment.

The advantage of the procedure described is not only the proper allocation of cost to all classes of service, including interruptible customers, but also the detailed presentation of the cost components. The method discloses for each class of service the incremental cost and the assigned joint and general cost, details which are lost completely with many other methods. It further makes it possible to show the different cost elements assigned to each classification, such as return, income taxes, operating expenses, etc., and thus permits easy adjustment when needed.

SOUTH CAROLINA ELECTRIC & GAS REVIEWS THREE YEARS OF HIGH-BTU OIL GAS

(Continued from page 21)

Operating cycle

4 minute cycle, designed for 6% carbon oil

	% of cycle
MAKE PERIOD	
1. Open make oil—reduce process steam	44
2. Close superheater stack	46
3. Close make oil—open high rate purge steam	79
4. Open spray purge	79
5. Close process steam	91
6. Close spray purge	91
7. Open blower	90
FORWARD BLAST AND HEAT	
8. Open blast	92
9. Open superheater stack	96
10. Open heat oil	1
11. Close heat oil	29
12. Close blast	31
13. Close superheater stack	32
14. Close outlet gas valve	31
BACK BLAST	
15. Open back blast and back blast stack valve	33
16. Close back blast and open blast stack valve	41
17. Close blower	42
18. Open superheater stack	42
19. Open outlet gas valve	43
20. Open process steam at high purge rate	43

SOUTH CAROLINA ELECTRIC & GAS COMPANY

Comparison of Present Gas Department Operations (Fuel Priced at Average August Prices) with Estimated 650 Btu Water Gas and 1,000 Btu Oil Gas Processes. Based on Output for 12 Months Ended August 31, 1949

	Present—Using August Prices				*650 Btu Water Gas*				*1,000 Btu Oil Gas*			
	Quantity	*Price*	*Mcf*	*Amount*	*Quantity*	*Price*	*Mcf*	*Amount*	*Quantity*	*Price*	*Mcf*	*Amount*
Production—Operation			832,110.0				690,651					
Fuel:												
Boiler Fuel	3,511	$9.55		$33,530.05	3,511	$9.55		$33,530.05	3,511	$9.55	449,339.4	$33,530.05
Fuel under Retorts	2,037	8.80		17,925.60								
Coal Carbonized in Retorts	12,101	10.34		125,124.34								
Water Gas Generator Fuel	9,046	8.91		80,559.86	6,689	18.50		123,746.50				
Oil	1,859,435	.0921		171,253.96	3,480,881	.06134		213,517.24	5,967,227	.06134		366,029.70
Propane	462,875	.0592		27,402.20								
Residuals (Credit)				(99,573.22)	690,651	.06		(41,439.06)	1,334,538	.06		(80,072.28)
Total				356,262.79				329,354.73				319,487.47
Labor and Other Expenses				127,579.35				127,579.35				127,579.35
Labor Savings (Credit)								30,834.40				57,293.20
Total				127,579.35				96,744.95				70,286.15
Total Production—Operation				483,842.14				426,099.68				389,773.62
Production Maintenance				46,645.03				22,421.38				20,476.95
Total Production				530,487.17				448,521.06				410,250.57
Production Cost per Mcf				63.75c				64.94c				91.30c
Production Cost per Mcf—540 Btu Basis				63.75c				53.90c				49.30c
Fuel Components per Mcf—540 Btu Basis				42.81c				39.58c				38.39c
Distribution				194,852.23				189,809.53				182,245.32
Total Production and Distribution				725,339.40				638,330.59				592,495.89
Saving over Present Operation								87,008.81				132,843.51
Less:												
Carrying Charges of 12% on Plant Additions Required (Plant—650 Btu $80,000 1,000 Btu $150,000)								9,600.00				18,000.00
Amortization of Conversion Charges—10 yr. (650 Btu $22,000 1,000 Btu $170,000)								2,200.00				17,000.00
Reduction in Revenue Due to Fuel Clause Reduction								23,427.29				31,236.39
Tax at 40%								20,712.61				26,642.85
Total								55,939.90				92,879.24
Net Savings								31,068.91				39,964.27

SOUTH CAROLINA ELECTRIC & GAS COMPANY

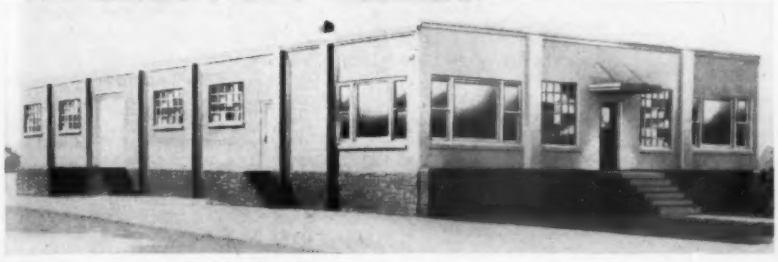
Estimated Construction Savings Under 650 Btu Water Gas and 1,000 Btu Oil Gas Processes

Project	*650 Btu Water Gas*					*1,000 Btu Oil Gas*				
	Total	*1950*	*1951*	*1952*	*1953*	*Total*	*1950*	*1951*	*1952*	*1953*
Gas Plant										
Minor Additions	$ 4,000	$1,000	$1,000	$1,000	$ 1,000	$10,000	$ 2,500	$2,500	$2,500	$ 2,500
Dust Collector No. 1 Boiler	2,500	2,500				2,500	2,500			
Coal Handling Equipment	7,400	7,400				7,400	7,400			
1–200,000 Cu.ft. Compressor	50,000			50,000		50,000			50,000	
1–12 ft. Generator	160,000*				160,000	160,000				160,000
Total	223,900	10,900	1,000	51,000	161,000	229,900	12,400	2,500	52,500	162,500
Distribution										
Minor Projects	31,200	7,200	7,600	8,000	8,400	78,000	18,000	19,000	20,000	21,000
6" HP Loop Huger & Whaley to Rosewood & Belt Line		61,500	(61,500)			61,500	61,500			
Unforeseen Major Projects	36,000	6,000	10,000	10,000	10,000	90,000	15,000	25,000	25,000	25,000
Total	67,200	74,700	(43,900)	18,000	18,400	229,500	94,500	44,000	45,000	46,000
Total Construction Savings	291,100	85,600	(42,900)	69,000	179,400	459,400	106,900	46,500	97,500	208,500
Estimated Cost of Plant Additions for Conversion	80,000	80,000				150,000	150,000			
Net Savings in Est. Const. Expenditures	211,100	5,600	(42,900)	69,000	179,400	309,400	(43,100)	46,500	97,500	208,500
Estimated Conversion of Customer Appliance Costs	22,000					170,000				
If Amortized over 10-Year Period	8,800	2,200	2,200	2,200	2,200	68,000	17,000	17,000	17,000	17,000

*Probably would be required in 1955.

News of the Gas Industry

CANADIAN METER COMPANY OPENS NEW PLANT



American Meter Company's subsidiary, Canadian Meter Co., Ltd., has completed construction of a new building in Edmonton, Alberta, to house the expanding activities of the company in Canada. A part of the general expansion program launched several years ago by the parent company, the new facilities provide a meter-run fabrication department and repair shops for displacement meters, orifice meters and control instruments as well as space for warehousing. J. W. Ostler, manager of Canadian Meter, reports that improved services, in all respects, are anticipated for customers in this part of Canada.

Heyke is Brooklyn Union Gas Pres

John E. Heyke, Jr., was elected president of Brooklyn Union Gas Co. at a recent meeting of the board of directors, succeeding the late president, Hugh H. Cuthrell.

John E. Heyke, Jr.

Mr. Heyke joined the company in 1933 and after cadet training he became a salesman, a district representative and a district house heating supervisor. In 1940, he became assistant personnel director, and he remained in personnel work until 1942.

In December, 1945, he was elected assistant vice president, and in June, 1948, vice president. He was named executive vice president of Brooklyn Union in September, 1951. In February of this year he was elected a member of the board of directors.

At the present time Mr. Heyke is a member of the managing committee of the general management section of American Gas Association.

Gas Turbine Slidefilm is Available

The availability of a new sound-color slidefilm on the uses, advantages, and manufacture of the gas turbine for gas pipeline pumping has been announced by General Electric Co.

Called "The El Paso Story," the slidefilm gives a presentation of the application of the G-E gas turbine to the long-distance transmission of natural gas. The film centers around the Cornudas, Tex., compressor station of El Paso Natural Gas Company's southern mainline where the first of 28 gas turbines for the El Paso transmission system was placed in operation.

Arrangements for viewing the industrial slidefilm can be made by contacting any apparatus sales office of the General Electric Co.

Gas Revenues Up in 2 Quarter

Total revenues of gas utilities from sales of gas to ultimate consumers for the second quarter of 1953 were $636 million, a gain of 14.1% over revenues in the comparable quarter of 1952, American Gas Association reports. For the 12 months ended June 30, 1953, revenues from sales to consumers totaled $2,609 million, a rise of 11.8% over the previous 12-month period. Industrial gas revenues rose 18.7% during the period, while residential revenues gained 8.9%.

The total revenues of gas utility and pipeline companies, including revenues from sales for resale, during the 12 months ended June 30, 1953, increased to $3,860 million for a gain of 14.2% over the like period of a year earlier. Net operating revenues increased to $520 million, a gain of 15.6%. Net income was $380 million in the cumulative period, showing no change from a year earlier.

Sales of gas in the second quarter of 1953 amounted to 13,419 million therms, an increase of 12.1% over the like quarter of 1952.

Revenues from the sale of natural gas to ultimate customers during the first quarter of 1953 were $524 million, an increase of 20.3% over $436 million a year earlier. For the 12 months ended June 30, 1953, natural gas revenues were $2,153 million, or 18.1% above revenues in the previous 12-month period.

Sales of natural gas in the first quarter of 1953 were 12,606 million therms, up 13.0% over therms sold in the like 1952 quarter. Sales of manufactured and mixed gas declined 0.1% during the second quarter of 1953, while revenues in this classification were down 8.0%.

FPC Will Not Set Return Rate

Federal Power Commission has no arbitrary floor or ceiling for the rate of return on investment that it will allow natural gas companies, and does not intend to establish any, Chairman Jerome K. Kuykendall told the annual meeting of Independent Natural Gas Association of America. Instead, he declared, the Commission intends to "exercise judgement unhampered by arbitrary, self-imposed restrictions which might be in conflict with the legislative standards which govern us." He noted that "there seems to be a belief among many members of your industry" that the commission has a policy of "keeping an overall ceiling on the rate of return and that the ceiling was recently raised."

Mr. Kuykendall explained that the Commission tries to "be consistent in our opinions in rate cases and consequently a decision in one case must be considered in . . . a decision in a subsequent case. But this does not mean that precisely the same rate of return will be allowed in all cases." He pointed out that (1) The Commission has agreed "on the principle involved," although not the specific language, in legislation which would deprive FPC of jurisdiction over gas companies operating entirely within the boundaries of a single state, even though the gas may have come from another state. (2) FPC is trying to use the "conference method of dealing with rate cases," informal procedures before formal hearings, as much as possible. (3) It is investigating other means of shortening and speeding its procedures and is "ready to eliminate any requirements that are shown to be unnecessary."

INGAA President C. P. Rather told the meeting that he and other association representatives have met with Mr. Kuykendall on means of speeding FPC procedures and added, "we propose to submit such suggestions." He said these would be for "revised procedures which will facilitate the work of the Commission and the business of the companies without in any way conflicting with the provisions of the Natural Gas Act."

Promote Gas Dryers in Philadelphia

Manufacturers and local distributors of gas clothes dryers, cooperating with Philadelphia Gas Works, recently presented a united clothes dryer advertising promotion in an issue of the *Philadelphia Evening Bulletin*. Advertisements equivalent to eight full pages appeared in the October 5 issue of the newspaper.

Those brands displayed in the advertising by manufacturers and distributors were: Bendix, Bryant, Caloric, Hamilton, Kenmore, Norge, Roper, Temco, Thor, and Whirlpool.

Glasby Mfg Co Expanding Plant

Construction has been started on the new section of the J. P. Glasby Mfg. Co. plant. This addition to present facilities is part of a long range expansion plan, enlarging executive, manufacturing and assembly departments.

AGA Launches Educational Program

A broad educational program designed to acquaint school children with the vital role played by gas in the modern economy has been initiated by the Educational Service Bureau of American Gas Association.

Materials used in the program, from film strips to booklets, were prepared in collaboration with the National Science Teachers Association and with the guidance of leading educators. A teacher's guide suggests ways of using the program materials to best advantage in schools and points out the many interesting scientific principles presented by natural gas as a study topic.

The National Science Teachers Association has agreed to mail out some 19,000 copies of the Teacher's Guide to its own mailing list.

Adams Products Names Distributor

Adams Pipe Repair Products has announced the appointment of Davis Meter Repair and Supply Co. as general distributors in Georgia, Florida, Mississippi and Alabama of Adams' complete line of pipe repair products.

Northern Producing Opens 2 Offices

Northern Natural Gas Producing Co., a subsidiary of Northern Natural Gas Co., has opened two new district offices for supervising gas exploratory activities. The new Denver, Col., office will supervise activities in Colorado, Wyoming, western Nebraska and northwestern New Mexico, and the new Billings, Mont., office will cover operations in Montana, North Dakota and South Dakota.

Earl E. Marshall is district geologist in charge of the Denver office, and W. E. Lumb is district geologist in charge of the Billings office.

New Office for Robertshaw-Fulton

The opening of a new Cleveland combination sales office and machine shop for the assistance of appliance manufacturers has been announced by Robertshaw Thermostat division, Robertshaw-Fulton Controls Co.

The office will handle all sales matters for the Cleveland district and the machine shop facilities will be available to appliance manufacturers while their appliances are being tested or altered for test at American Gas Association's Cleveland laboratory.

W. F. Cathcart will be in charge of the office, 1535 E. 55 St., with the assistance of L. V. Smith and Evelyn Macerol.

Equitable's Odorization Program Nears Completion

The odorization of Equitable Gas System's delivery throughout the Pittsburgh metropolitan area is entering its final stages.

The gas will not carry an unnecessarily strong odor. It has been determined that the mixing rate is adequate if it will enable customers to detect the odor when gas is present in as small quantities as 1% by volume in any given air space. This 1% mixture of gas and air is well within the limits of safety.

Equitable's odorization process is accomplished by injecting the odorant into the distribution system at selected points. At these stations the odorant is fed into the lines at a rate proportional to the rate of flow within the distribution lines. The odorizing mechanism automatically adjusts the odorant injection rate to compensate for any variation in rate of gas flow through the lines.

This type of installation maintains a constant controlled odorization rate over the system and assures reliable performance. All gas provided by Equitable in the Pittsburgh district during the past Summer either had the natural odor present or was artificially odorized through the operation of facilities located at the stations. During periods of colder weather this Fall and Winter, odorization facilities located at two other stations will also be operated to accomplish the same result.

The odorizing material presently being used by Equitable is "Calodorant C Special." When introduced into the lines it vaporizes to become a minute part of the total gas flow. The odorant has no effect on the heating value or combustion characteristics of the odorized gas. Neither does it affect gas appliances or products processed with gas heat.

It is primarily due to the wholesale importation of the relatively odorless natural gas from the mid-continental U. S. fields that odorization is becoming prevalent in Equitable's service area. Appalachian natural gas has its own characteristic "gassy" odor.

Gas Sales Gain in August

Sales of the gas utility industry to ultimate customers during August, 1953, totaled 3,487 million therms, a gain of 2.9% over sales in the same month a year ago, American Gas Association reports. The August AGA index of total gas utility sales is 158.5% of the 1947-1949 average.

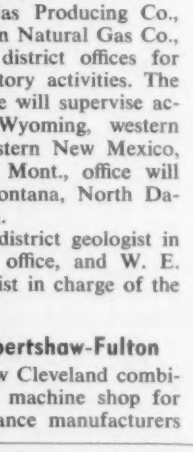
For the 12 months ended August 31, 1953, utility gas sales totaled 55,694 million therms, an increase of 10.5% over therms sold in the previous cumulative period.

Natural gas utility sales in August totaled 3,315 million therms, an increase of 2.9% over sales in August, 1952. For 12 months ended August 31, sales of natural gas amounted to 52,440 million therms, a gain of 11.6% over sales in the previous 12-month period. The index of natural gas sales for August was 165.9% of the 1947-1949 average.

Manufactured and mixed gas sales in August totaled 172 million therms, a decline of 3.5% under a year earlier. For the 12 months ended August 31, manufactured and mixed gas sales were 3,254 million therms, down 3.5% under the previous comparable period. The index of manufactured and mixed gas sales in August was 84.8% of the 1947-1949 average.

Edward M. Borger

Edward M. Borger, former president and managing director of The Peoples Natural Gas Company, Pittsburgh, Pa., chairman of the board of New York State Natural Gas Co., and a director of Consolidated Natural Gas Co., died September 20 at the age of 52. His passing came within three weeks of the announcement that he had relinquished his duties with the various natural gas enterprises for reasons of health.



Edward M. Borger

Mr. Borger's entire business career was identified with the natural gas industry, his first association with Peoples dating back to 1922, at which time he was studying law under the preceptorship of Christy Payne and Arthur Young, while taking law and business administration courses at Duquesne University. After admission to the Pennsylvania Bar, he became attorney for Peoples and New York State natural, advanced to general counsel in 1935, and was elected president in 1940.

During his active career, he was identified with many civic projects in the greater Pittsburgh area, serving as a member of the Executive Committee of the Allegheny Conference on Community Development, and numerous district planning associations in Allegheny County.

Unmarried, Mr. Borger is survived by his mother, Mrs. Alice A. Borger, Sewickley, Pa., and two brothers, Denton Borger, secretary of Hope Natural Gas Co., Clarksburg, W. Va., and H. D. Borger, vice-president and treasurer of The Peoples Natural Gas Company.

P. J. Erickson, Jr.

P. J. Erickson, Jr., vice president and chief engineer of Arkansas-Louisiana Gas Co., died September 4, at the age of 41.

Mr. Erickson moved to Shreveport with Arkansas-Louisiana Gas Co. as a junior engineer in 1936, and served in the gas pipeline, engineering, service, and rate and valuation departments. He was assistant manager of the rate and valuation department at the time of his promotion to a vice presidency last April.

Mr. Erickson was a member of American Gas Association, and the Mid-continent Oil and Gas Association.

George R. Steere

George R. Steere, well-known throughout the gas industry, died September 2, at 60 years of age.

With Steere Engineering Co. since 1919 as sales and operating representative, he continued in that capacity after the company's purchase by Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., in 1927. From 1939 to 1949 he was associated in an executive capacity with Portland (Me.) Gas Light Co. and Seattle Gas Co. Most recently, Mr. Steere was New England sales representative for Semet-Solvay Engineering Div. to which he had returned in 1949.

Mr. Steere was a member of American Gas Association, The New England Gas Association, and Guild of Gas Managers.

Gas Import-Export Authority to FPC

President Eisenhower signed an Executive Order authorizing Federal Power Commission to issue permits for construction, operation, maintenance and connection, at borders of the United States, for facilities required in importing or exporting natural gas. The order authorized the FPC chairman to sign the permits.

A statement issued by the White House explained, "At the present time . . . the Federal Power Commission receives applications for these permits and obtains the recommendations of the Department of State and the Department of Defense concerning those applications. That procedure is continued under the new order. However, the actual issuance of the permits is at present accomplished by the President. Under the new order the permits will be issued by the Chairman of the Federal Power Commission except that in any instance where disagreement exists among the agencies concerned the application for permit will be presented to the President for his consideration.

"Under the Federal Power Act and the Natural Gas Act the transmission of electric energy from the United States to a foreign country and the exportation of natural gas from or to the United States requires an authorizing order of the Federal Power Commission. Hence permits for the construction of facilities at the border will be issued only in instances where the Commission has by order authorized movement across the border of electric energy or natural gas."

Gas Appliance Shipments Top 1952

Shipments of domestic gas ranges during 1953 continued to exceed those shipped during last year, according to Edward R. Martin, director of marketing and statistics, Gas Appliance Manufacturers Association. August shipments increased the total for the year to 1,431,400 units, a 4.4% gain over units shipped during the first eight months of 1952.

Total shipments for August amounted to 168,500 units, a drop of 5.7% below the same month of last year.

For the past 15 months shipments of automatic gas water heaters have exceeded those of the corresponding month in the previous year, according to Mr. Martin. August shipments amounted to 163,500 units to increase the total for the first eight months of 1953 to 1,471,200, a 21.8% rise over the same period of last year.

Also, Mr. Martin announced that shipments of gas-operated central heating systems increased nearly 50,000 units during the first eight months of this year over the same period of 1952. Manufacturers shipped 469,826 furnaces, boilers and conversion burners in the first eight months.

Gas-fired furnaces shipped during August totaled 46,900 to increase the total for the year to 305,699, an increase of 17.7% over last year's eight-month total. The month's total was 8.6% below the units shipped during August of 1952.

Gas conversion burners shipped during the first eight months of 1953 totaled 124,200.

GAS GIVES HEAT CONTROL NEEDED FOR NEW CASTINGS

Gas is providing the fast, efficient, controllable heat necessary for a relatively new concept of industrial metal casting.

The new process is shell molding, also known as the Croning or "C" process, and since World War II it has been filling the gap between rough castings of the green sand process and the precision castings of the investment or lost-wax process.

This process is being used for automotive, marine and aviation castings; tools; plumbing and heating fittings; pressure pipe; ordnance and ornamental metal work, ferrous and non-ferrous alike.

Experimentally, it has even been used to cast such precision pieces as pistol hammers and triggers.

The main advantages of this new casting process is that it produces low-cost castings with greater accuracy and higher quality. It is clean; requires less equipment space; saves metal by casting closer to specifications; and makes sound, smooth-surfaced castings that minimize finishing operations.

Gas is used in turning out the thin shells into which the molten metal is poured to form the finished product.

Each mold is actually made by clamping two shell halves together. These shells, consisting of a sand and resin mixture, must be nearly-perfect to insure top quality finished products.

Thompson Products, Inc., at its plant in Bell, California, is one of the most recent firms to take advantage of the merits of this process.

The firm's chief engineer told Southern California Gas Co. that gas furnaces maintain the even temperature control so essential to accurate smooth-surfaced, sharp-edged, fin-free products.

To make one of these shells, the original form that is to be followed, or the pattern, is heated in a gas oven. A sand-resin mixture is then applied to the pattern, with the heat from the pattern causing the resin to flow and form the shell.

This shell is cured in another gas oven and then stripped from the pattern. The shell, plus its matching shell half, forms the actual mold into which molten metal is poured.

Two AGA Reps on ASA Committee

American Standards Association has announced the appointment of two new members to represent American Gas Association on the ASA committee on approval and installation requirements for gas burning appliances. The new members are J. C. Reid, vice-president, Southern Union Gas Co., Dallas, and Dr. Carl T. Ashby, assistant chief engineer, Servel Inc.

The ASA committee is concerned with establishing basic requirements for installation, performance, safe operation, and construction of gas appliances and piping systems.

Safety Award to Philadelphia Elec

Philadelphia Electric Co. has received the American Gas Association honor award for achieving the best safety record for gas utilities in its size classification for the year 1952.

MEN AT WORK

Plank is Peoples Superintendent

Richard J. Plank has been appointed general superintendent of The Peoples Natural Gas Co.

Richard J. Plank

Mr. Plank, former superintendent of distribution will, in his new position, have superivision over all operating departments and divisions of the company, including production, transmission, and distribution, all Engineering activities, as well as geological, land and lease departments, and field districts. He will be responsible to Christy Payne, Jr., vice president.

Mr. Plank began his term of service with Peoples as a civil engineer in 1936. He was made chief civil engineer in 1942, and superintendent of distribution in 1944.

Brown is Pres of So Ind G&E Co

A. B. Brown, executive vice president and general manager of Southern Indiana Gas and Electric Co., has been elected president, succeeding F. Bayard Culley whose retirement was effective September 30, 1953. Mr. Culley will continue as a director, as will Mr. Brown.

Mr. Brown has been associated with the Southern Indiana company since 1926. He was elected vice president and operating manager in 1949 and became executive vice president in 1952. His first duties with the company were as test engineer, and he served in successive positions as chief engineer, Ohio River station, and general superintendent of electric, gas, heating and water operations.

Inghram is NYS Natural Director

Edward C. Inghram has been elected a director of New York State Natural Gas Corp. In January, he was appointed general superintendent of the Pittsburgh-based corporation. He was previously superintendent of production and storage.

Mr. Inghram began his 21-year term of service with the company in the Tioga district. He was promoted to superintendent of the district in 1938. In 1946, he was made assistant superintendent of production and storage for The Peoples Natural Gas Co., sister company of New York State Natural.

Borchers Appointed Bristol GSM

F. W. Borchers has been appointed general sales manager of The Bristol Co. Mr. Borchers joined the company in 1922 and in 1933 was appointed district manager of the Birmingham office. In 1935 he became district manager of the Philadelphia office, in 1946 district manager of the New York office and in 1948 he was appointed assistant sales manager.

He will maintain his headquarters at the company's main office at Waterbury, Conn.

Fouse is Brooklyn Boro Gas VP

Ralph W. Fouse has been appointed vice president of the Brooklyn Borough Gas Co., his appointment having been approved at the regular monthly meeting of the board of directors. Mr. Fouse assumes the office previously held by Frederick Stehman, who retired on August 1.

Mr. Fouse joined Brooklyn Borough in 1951, after 26 years with Consolidated Edison Co. of New York.

Arkansas Western Names Dist Mgr

Joe Ganner has been made district manager of Clarksville district properties, Arkansas Western Gas Co. Mr. Ganner will be in charge of the company's new business activities and transmission and distribution operations in the district.

Employed by Arkansas Western in 1945, Mr. Ganner has been associated with the gas industry for the past 25 years. He had previously worked for the Shamrock Natural Gas Co., Tex., and later with Tri-Cities Gas Co., Okla.

McWilliams Is Pitts Peoples Div Mgr

Walter E. McWilliams has been appointed manager of the industrial and commercial division, sales department, The Peoples Natural Gas Co., succeeding Irving D. Ross, who is retiring after 23 years service with the company.

Mr. McWilliams will be responsible for contacts with Peoples industrial gas customers, and indirectly responsible for commercial sales activities supervised by James W. Vance.

Bastian-Blessing Names Dept Head

Robert E. Poethig, director of research and development for The Bastian-Blessing Co., will head the company's newly-consolidated department of research and production engineering. Mr. Poethig has been associated with Bastian-Blessing since 1939.

ARTHUR BATTEN has joined the legal department, *Columbia Gas System.*

R. G. CAMPBELL has been named sales engineer, *American Meter Co.*

RICHARD E. DUVALL was appointed superintendent of distribution, *Peoples Natural Gas Co.*

LELAND G. HANNA is now division superintendent, metropolitan Pittsburgh, *Peoples Natural Gas Co.*

H. H. HOLMES was appointed sales engineer, *American Meter Co.*

HOWARD W. JOINER has been named assistant superintendent, distribution, *Peoples Natural Gas Co.*

JOSEPH E. LINDSAY was advanced to assistant manager, engineering service department, *National Radiator Co.*

GERALD H. LUSHER has been appointed refractories engineer, *Norton Co.*

PRESTON PARKS is now chief engineer, *Colorado Interstate Gas Co.*

JAMES B. SAYERS has been elected a director, *Peoples Natural Gas Co.*

WILLIAM SPENCER was appointed assistant chief mechanical engineer, *Peoples Natural Gas Co.*

DARWIN WHIPKEY is now safety director, *New York State Natural Gas Corp.*

JOHN T. YOUNG has been named sales representative, Western div., *Canadian Meter Co.*

DEPENDABLE CORROSION DATA IN SHORT LAB SOIL TEST

A recent study by the National Bureau of Standards has shown that reliable data on the corrosion of ferrous metals in soils of various types can be obtained in the laboratory in a period of six months. Usually field tests lasting 10 years or more are required. In the NBS investigation, which was conducted by W. J. Schwerdtfeger of the Bureau's corrosion laboratory, corrosion was produced in small laboratory cells by differential aeration of metal disks in contact with soil within the cells. The results for 15 different soils showed good correlation with the corrosion observed on wrought specimens in long-term exposure tests. The technique used by the Bureau should thus provide a valuable basis for predicting the service of iron and steel structures exposed to various soils.

The corrosion of metals in many soils is attributed chiefly to differences in the accessibility of oxygen to the surface. Differences in oxygen concentration create differences in the potential of various areas, resulting in the flow of electric currents through the soil from the oxygen-deficient areas (anodes) to those areas (cathodes) receiving more oxygen. The laboratory corrosion cells used by NBS made use of this principle. Each cell consisted of a cylindrical Lucite enclosure containing two short-circuited disk-shaped electrodes of the same material, iron or steel. One electrode was solid, the other perforated, and they were separated by a layer of moist soil. The edges and one face of each of the two electrodes were covered with bituminous paint. The layer of moist soil in contact with the coated side of the perforated electrode regulated the diffusion of air to the electrodes. The perforated electrode received a greater supply of oxygen than the solid one adjacent to which the soil was puddled, and therefore assumed a more positive potential.

If the corrosion of ferrous metals in all soils proceeded at a rate that was constant with time, weight-loss measurements made after a short arbitrary period of exposure should indicate relative rates of corrosion, assuming negligible cleaning errors. Actually, however, corrosion in soils may proceed at a rate proportional to time, or may sometimes cease entirely, depending on the type of soil. It was thus necessary to operate the laboratory corrosion cells for a sufficiently long period to produce effects comparable to those shown by field exposure tests.

In the NBS investigations, the corrosion cells were kept on short circuit for six months. During this time periodic measurements of cell current permitted study of the progress of corrosion with time. At the end of the period the combined weight losses of the two electrodes were taken as the measure of corrosion.

To evaluate the laboratory corrosion cell as a means for predicting corrosion in the field, samples of soil collected at 15 NBS exposure sites were used. The results were correlated with weight-loss measurements made on short lengths of steel and wrought iron pipe which had been exposed for 10 years at the same 15 localities. An empirical equation relating the laboratory and field data indicated that the laboratory measurements could be used to predict field weight losses with root-mean-square error of about ± 4 oz/ft^2 for corrosion rates ranging from 2.5 to 30 oz/ft^2 for the 10-year exposure period. Because the 15 soils covered the range of corrosivity of the soils of the United States, this empirical relationship may be applicable to any soil.

Because some underground structures, such as piping systems and storage tanks, usually fail as a result of pitting, this factor was also considered. Analysis of the field data showed a good correlation between weight losses and maximum pit depths on wrought ferrous specimens which had been exposed for 10 years at 58 NBS exposure sites. These data were then combined with the first empirical equation to obtain a second equation which can be used to predict, with an average error of ± 18 mils, the depth of the deepest pits occurring on wrought iron or steel buried for 10 years. For the prediction of weight losses and maximum pit depths on areas greater than the area of the field specimens and for periods of exposure other than 10 years, use was made of general equations relating weight losses and maximum pit depths with length of exposure and exposed area. Average values for the constants to be used in these equations were obtained.

It was found that the corrosion cell could detect significant differences between the corrosion rates of cast iron and steel, which are generally considered to corrode at about the same rate in soils. Thus, the cell might be used to study the effects of variables, including composition upon the corrosion rates of steels. It is also reasonable to expect that laboratory corrosion cells could be used to predict the corrosion of nonferrous metals—copper, brasses, lead, zinc and possibly aluminum—in various kinds of soils. Although measurements with the laboratory cell should not be considered as replacing field exposure tests entirely, it is unlikely that materials which corrode at the same rate in the laboratory would corrode at significantly different rates in the field. Hence, the corrosion cell should serve a useful purpose in the selection of materials for field exposure tests.

AGA Issues Approval Seal Folder

A new consumer folder has been issued by American Gas Association Laboratories to aid the gas industry in its sales and promotional efforts. Entitled, What Does This Seal Mean To You?, the text of the folder outlines what the Laboratories approval seal means. It briefly tells the story of the testing and inspection activities of the Laboratories and their relation to manufacturers of appliances.

Designed for distribution by gas companies, appliance manufacturers and dealers, the folder may be obtained from AGA Laboratories, 1032 E. 62 St., Cleveland 3, at these prices: 100 to 999 copies, $2.00 per hundred; 1,000 to 9,999 copies, $1.50 per hundred; and 10,000 or more copies, $1.20 per hundred.

Bond Market Is Improving Rapidly

(Continued from page 25)

of some of their holdings of these securities without portfolio loss which now would be occasioned, and place them in more liquid position to accommodate corporate needs for funds.

Although business inventories at last report stood at $77 billion, total business sales have been running at a $49.9 billion rate, up $583 million for the latest month. According to Department of Commerce figures, the ratio of inventory stocks to sales volumes still is below the level of a year ago.

Despite their slow advance of the past few days, stock prices currently are well below the level of a month ago in a market which is practically devoid of speculation, which contains only a relatively small proportion of investment absorption and which is mostly professional in nature. At the moment the prospect of tax reduction is the most favorable factor affecting, or likely to affect, stock prices in the months immediately ahead. Excess profits taxes will expire at the end of 1953 and this is estimated to mean corporate savings of around $2 billion. Under existing law normal income and surtaxes are to decline to 47% next April 1 (from 52% at present) but at this writing it looks as though Congress will tack on an additional 3% to the 47% and bring the new rate to 50%.

Corporate profits before taxes this year, to date have been running at an annual rate of $44 billion. Corporation taxes have been accruing at an annual rate of about $24 billion, leaving net profits after taxes of approximately $20 billion. A 25% decline in pre-tax profits next year would leave profits before taxes of $33 billion. At a 47% tax rate, corporate taxes would be only $15.5 billion and profits after taxes $17.5 billion. At the more likely 50% combined normal income and surtaxes, both taxes and profits after taxes would amount to $16.5 billion.

Thus, a 25% decline in pre-tax profits would mean only a 12½% decline in profits after taxes at a 47% corporate rate and a drop of 17½% at a 50% corporate tax rate.

True to its customary procedure, the stock market, in its early September sharp decline, seems to have gone overboard in its bearish appraisal of the business outlook and of the progress which the Eisenhower Administration has made during its short period in office in unraveling the mess woven by 20 years of Democrats. The creation of an environment of greater confidence is a piecemeal task that can be accomplished only over a period of time. Because the actual results to date have not been tremendous, business and the markets are inclined to skepticism. Gradually, the efforts of the Administration will make themselves felt and we believe the policy-makers are big enough to change their course as illustrated by the more moderate policy followed in connection with Federal Reserve policy and the Government bond market.

Neither the greater progress toward a balanced budget nor the recent steadiness of spot commodity prices, nor the success of the latest Government financing, has been sufficient to generate real confident buying of stock in any substantial measure. There are signs of a rounding-off of business which should not occasion any great surprise, but the deterioration of stock prices prior to their recent very modest recovery has in many cases been extreme, far too much so on cold appraisal of the economic facts currently in being.

Cautions on Sales Contract Entanglements

(Continued from page 26)

buyer and the seller are bound to strictly comply with the terms of a contract of sale.

In Stimpson Company v. Cawell, 158 N.E. 777, testimony shows that a dealer in gas appliances and a purchaser entered into a written contract of sale, for a gas appliance, which provided that the buyer should not have title to the appliance until it was paid for in full. The contract further provided that if the purchaser defaulted payment the seller could repossess the appliance. In other words, no suit was required for the dealer to repossess the appliance in the event the purchaser defaulted in making agreed monthly payments.

Later, the buyer refused to make agreed payments on the contention that the appliance was not satisfactory. The seller demanded that the purchaser return the appliance. The latter refused to do so unless the seller returned the initial payment. The seller sued the purchaser, to recover the full balance due on the account.

Although the lower court held the buyer not liable, the higher court reversed the verdict saying: "By the terms of the contract, upon default in any payment or other condition, the vendor (seller) was given the right to remove the property. . . . As the defendant (buyer) refused to deliver unless a condition which he had no right to impose was complied with, he was guilty of conversion."

This court explained that had the buyer returned the appliance when the seller demanded it, the buyer may have entered suit against the seller and recovered the initial payment plus all damages which he incurred, if he had proven that the appliance was not reasonably satisfactory. However, since in the contract of sale the buyer had agreed to return the appliance to the seller, if the former defaulted in making payment, the buyer automatically breached the contract by refusing to return it.

Right to repossess

Modern higher courts consistently hold that a gas company cannot repossess "legal fixtures" from a buyer who lives in a rented building. The same law is applicable if the building in which the appliance was installed is mortgaged or later sold by the buyer.

First, it is important to know that the courts all agree that the most controlling tests of whether gas appliances installed in buildings are to be deemed "fixtures" or chattels is both the manner of attachment, and intention of the parties when the sale contract was made.

Of course, if a dealer fails to properly record a conditional contract, or mortgage, he cannot repossess an appliance, irrespective of whether it is permanently or temporarily attached to a building.

For illustration, in Knoxville Gas Company, 32 S. W. (2d) 1054, it was shown that a gas company sold gas stoves to a contractor who constructed an apartment building. The stoves were attached to a single gas or supply pipe by means of a threaded "union" or "collar." The chattel mortgage given by the contractor clearly provided that the stoves were to remain the property of the gas company until paid for by the contractor.

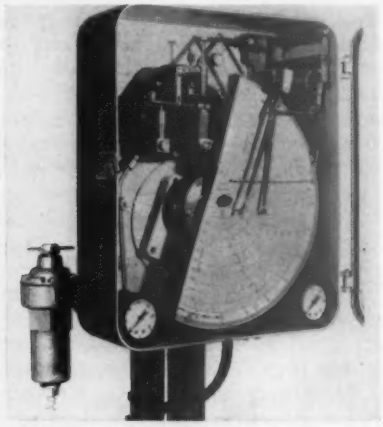
Soon afterward a person purchased the building and, although the gas stoves had not been paid for, the court held that the gas company could not remove them from the building because the chattel mortgage was not recorded and the purchaser of the building had no knowledge of its existence. This court said:

"If the purchaser of an apartment house had to ascertain, at his peril, whether every electrical device, gas equipment, kitchen cabinet, and the like, were paid for, there would be imposed upon him an arduous, if not an impossible, task. . . . In making sales upon the partial payment plan, it is just as easy to take a mortgage and have it recorded, and little additional expense is incurred thereby."

NEW EQUIPMENT

Differential controller

A newly developed differential controller for change-over valves, this device has been designed for orifice meter measuring



stations where a wide variation of flow conditions is encountered. It offers, the company reports, a positive means of automatically turning an additional measuring unit into the line when needed and shutting it off completely when not needed. The controller operates in this manner: when the differential across the primary orifice reaches a predetermined maximum setting the controller actuates a 4-way valve which admits the supply from the regulator to the cylinder, opening a second valve. This puts the secondary meter into service in addition to the primary meter. When the load drops and the differential of the 2 meters in operation falls below the pre-set minimum, the 4-way valve is repositioned by the controller. This admits pressure to the cylinder, closing the second valve and shutting off the secondary meter. The differential control unit is mounted in the orifice meter case. A minimum of 10 psi is required to actuate the control unit and 50 psi to operate the second valve cylinder.

Differential Controller. Rockwell Mfg. Co., 400 No. Lexington Ave., Pittsburgh 8, Pa.

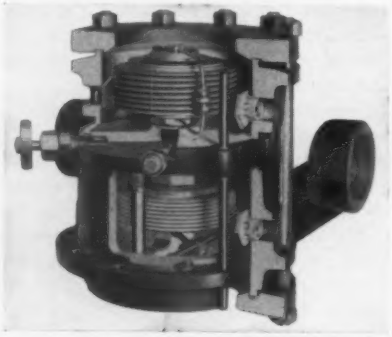
Impregnator

This recently developed impregnator is said to stop leakage of air or gases in metal castings, and reportedly has worked well with aluminum and iron castings. The manufacturer states that it oxidizes slowly making it a rust and corrosion preventative, and its 40% solids are inert resins, which remain elastic and unaffected by extreme heat or cold. Application consists of immersing castings in the formula, the company reports, without using pressure or vacuum equipment. Immersion time depends on the thickness and porosity of the casting. Following the impregnating process, the penetrating qualities of the formula are said to permit further machining, such as honing.

Nelsonite C3 Impregnator. Nelsonite Chemical Products, Inc., 900 Monroe Ave., N.W., Grand Rapids 2, Mich.

Orifice meter

This metal bellows actuated differential pressure instrument is now in production to supplement the manufacturer's line of

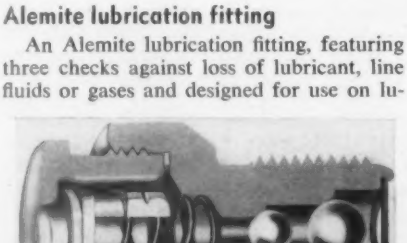


a series of mercury manometer orifice meters. For applications where accurate measurement is required without the use of a mercury manometer, the new units feature: 1-piece stainless steel bellows construction, direct full scale recording pen movement without external gearing or linkage multiplication, employment of the company's nearly frictionless Teflon seal stuffing box, and stainless steel or Monel metal operating parts. Internal working parts are said to be accessible for inspection, calibration or cleaning, by removing one, or both, case cover heads without disturbing manifold piping. Distortion or bellows damage due to sudden over-range is reportedly prevented by stick-proof check valves with flat synthetic seats. An additional bellows compensates for volume changes in bellows filling fluid resulting from ambient temperature variations. The instruments operate at working pressures to 1,000 psi, in differential ranges of 20″, 50″, 100″ and 200″, ambient temperatures of —25° to 175° F.

Dri-Flo Orifice Meters. American Meter Co., Erie, Pa.

Alemite lubrication fitting

An Alemite lubrication fitting, featuring three checks against loss of lubricant, line fluids or gases and designed for use on lu-

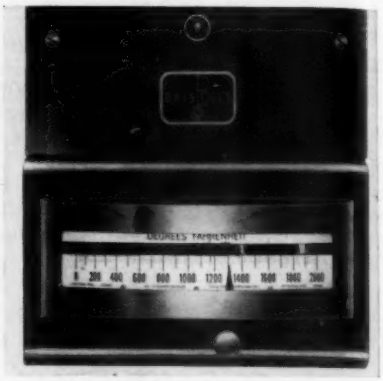


bricated plug valves, where extreme back pressures are encountered, has been announced. The fitting features two ball checks augmenting the standard check valve at the top of the fitting, which, it is said, gives protection against escape of line fluids and makes it practically impossible for foreign matter to foul all checks at the same time. The fitting permanently replaces the lubricant screw so that the lubricant may be injected into the valve directly from a hand gun or bucket pump, it is reported.

Alemite Lubrication Fitting. Stewart-Warner Corp., Alemite Div., 1826 Diversey Pkwy., Chicago 14.

Pyrometer controllers

A new line of free-vane electronic pyrometer controllers; which actuate relays, electric contactors, solenoid valves and motor

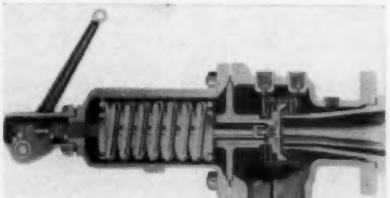


valves to provide close temperature control of furnaces, ovens, salt pots, and other heating equipment, has been announced by the manufacturer. The controllers feature an electronic control system based on the frequency modulation principle, a newly-developed millivoltmeter mechanism, and unit plug-in construction. All models are available with thermocouple failsafe protection in case of thermocouple burn-out or other failure. The units are available in a selection of temperature ranges from 0-400° F to 0-3,000° F.

Free-Vane Controllers. The Bristol Co., Waterbury 20, Conn.

Internal heat exchanger

Available in all of the manufacturer's nozzle and semi-nozzle safety relief valves, this internal heat exchanger can be incor-



porated in the valve body without creating interference with the rest of the valve mechanism. The internal heat exchanger is said to eliminate the necessity of steam tracing or steam jacketing a valve where highly viscous lading is encountered, and to keep the lading material in a fluid state with low steam consumption. It consists of a steel coil inserted into the valve body and led out to connect with a steam line. The coil ends reportedly are accessible for return-pipe installation or one-pipe installation with a vent valve.

Farris Internal Heat Exchanger. Farris Engineering Corp., 507 Commercial Ave., Palisades Park, N. J.

Gas burners

A series of commercial gas burners in stock sizes from 450,000 Btu input upward to 11,520,000 Btu or more, this multiple section upshot burner is said to be easily installed through the ash pit door. It features numerous possible combinations of burner heads and individual venturi mixing

tubes for each burner head. Primary air entrainment is high, and adjustment is provided for various types of fuel gas. No refractory combustion chamber liner is used, and all heat is transferred immediately to the furnace or boiler. A metal

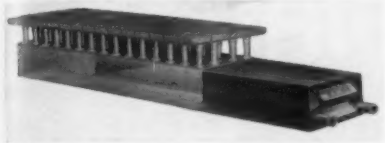


plate set flush with the burner heads prevents heat from reaching the boiler base and is said to reduce boiler room temperature. When recommended controls are used, the burner is step-acting and is modulated so that various burner sections come on in sequence instead of all at once. Burner head sections may be controlled either by independent manual or by automatic valves.

Commercial Gas Burner Series. Petro, 3170 W. 106 St., Cleveland 11.

Hydraulic truck outriggers

Hydraulic-operated outriggers are now available as optional equipment with the manufacturer's truck-mounted crane with

loadline capacity of 6,400 lbs. and power-swinging boom which telescopes from 12′ to 22′. The operator can raise and lower the outrigger legs by manipulating controls at his regular operating station, the manufacturer reports. Hydraulic power swings the boom 180°, and lifts it through an arc of 100°. The company states that if the truck is on uneven ground, the operator can use the outriggers to level the truck before picking up a load.

Model B Pitman Hydra-Lift. Pitman Mfg. Co., 300 W. 79 St., Kansas City 14, Mo.

Line valve

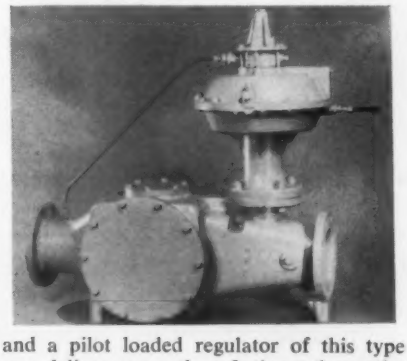
This new 5-bolt, 18-inch line blind valve, designed to accommodate larger pipelines, has an ASA rating of 150 lbs. for working

pressures up to 230 lbs. It provides either a full-diameter, smooth, round opening, or a permanent, leakproof shut-off. The neck of the spectacle plate on the valve is suspended on the top bolt so that it can be revolved in either direction when opening or blinding the line. The 2 side bolts swing out, making it unnecessary to remove any bolts when reversing the spectacle plate. It is said the 5 bolts on the valve can be quickly spread and tightened, even in close-couple, compact manifolds, by one man. The bar operated bolts eliminate wedges, hammers and wrenches needed for spreading conventional flanges according to the manufacturer. Regularly constructed of carbon steel, the valves can be made of other materials for special requirements. Standard packings are of a highly resistant synthetic rubber. Other packing materials are available to meet specific needs.

Hamer 5-bolt, 18-inch Line Blind Valves. Hamer Oil Tool Co., Long Beach 6, Cal.

Pilot loading system

This new pilot loading system was designed to increase the safety and versatility of the company's standard 014 regulators,



and a pilot loaded regulator of this type can deliver more than 3 times the outlet pressure obtainable with a standard weight loaded regulator, or 10 psi as compared with 3 psi, the manufacturer reports. Valves of the pilot loaded 014, in a safety feature of the new system, automatically close in case of inlet pressure failure or diaphragm case breakage. The entire mechanism is enclosed to discourage tampering. The increased pressure range of pilot loaded regulators is said to extend their field of application to include installations that formerly required a high pressure regulator. Complete systems are available for changing over existing 014 regulators to power pilot loading.

Pilot Loading System. Rockwell Mfg. Co., 400 No. Lexington Ave., Pittsburgh 8, Pa.

Automatic recorder

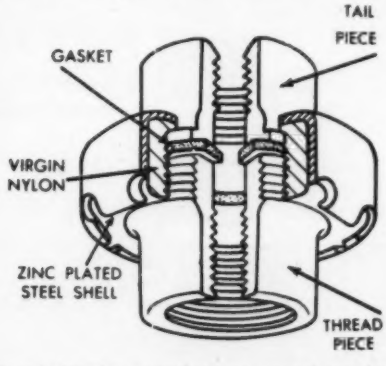
While this instrument is not new, the fact that it is now being offered for sale is new. Formerly it was available only on a lease basis. The instrument is used for the automatic, continuous recording of concentrations of oxidizable sulfur compounds such as H_2S, SO_2, mercaptans, thioethers, and organic disulfides in gas streams. It monitors and records sulfur compounds in concentrations as low as 0.1 part per million or 0.005 grains per cu ft, and will indicate a change in concentration in less than 30 seconds, the manufacturer reports. Also, the company states the instrument can be used to record odorant levels, to determine corrosive sulfur concentrations, for use with blending operations, and in the treatment of high-sulfur gases. Two models are of-

fered: one as a semi-permanent installation, and one portable for plant and field use.

Titrilog Models 26-102 and 26-103. Consolidated Engineering Corp., 300 No. Sierra Madre Villa, Pasadena 15, Calif.

Insulating meter nuts

The new line of insulating meter nuts and unions, employing molded nylon over which a zinc-plated steel shell is crimped,



is said by the manufacturer to reduce electrolytic corrosion of gas and water piping which results from contact between dissimilar metals. The nut utilizes the strength and insulating properties of molded nylon in forming a strong union between the tail piece of the meter and pipe. The two metal parts in the union are separated by a gas resistant insulating gasket which serves to retain pressure. An opening in the center of the nylon is machined to proper tap drill size and tapped to the proper thread size.

Insulating Meter Nuts and Unions. Universal Controls Corp., 731 W. Davis St., Dallas, Tex.

Abrasive blades

Abrasive blades that cut masonry materials with speeds approaching those of diamond blades have been announced. The new blades reportedly will slice through a 2″ by 5″ natco furing tile in 11 seconds, through dry press fire brick in 5 seconds, face brick in 8 seconds and concrete block in 17 seconds. The wet cutting blades are said to have been thoroughly tested at speeds in excess of standard operating speeds. Features include: factory dressed cutting edge, protective blade blotters (to

(Continued on page 50)

All 4 Major Construction Services for Gas Companies

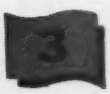
United now offers all four of the major services for the current construction programs of operating gas companies. These items, with the U.G.I. apparatus and processes that have been offered through the years, round out a complete and flexible engineering and construction service.

GAS MAINS AND PIPE LINES

Pipe lines—distribution mains—water and river crossings. Inspection —construction—or construction management.

OIL GAS SETS

Heavy oil regenerative apparatus—new and converted apparatus for light oil—light oil recovery plants—oil gas plants and auxiliaries.



CCR SETS*

Produces low and high gravity city gases, synthesis gases, gases of sendout heating values from 700 to 1,000 Btu—using natural gas, L.P. gases, gasoline, naphtha, or kerosene.

GENERAL PLANT EXTENSIONS

Through the years United has built up large, well organized forces for handling general plant extensions. These include equipment required for natural gas such as city gate and odorizing stations, and plant equipment such as tar handling, oil scrubbing, compressors and boiler plants. Long experience in gas plant construction and a thorough knowledge of plant operating conditions have developed a unique background for this work.

The services provided by United are flexible and may be adjusted to meet your specific needs. For certain projects only engineering, inspection or construction supervision is furnished. For others the design and construction of U.G.I. apparatus is provided. Still other projects are designed and managed completely by United's forces using directly employed or subcontracted labor.

No matter what your project we invite you to share our experience and facilities as designers, contractors and consulting engineers.

*Patents Pending

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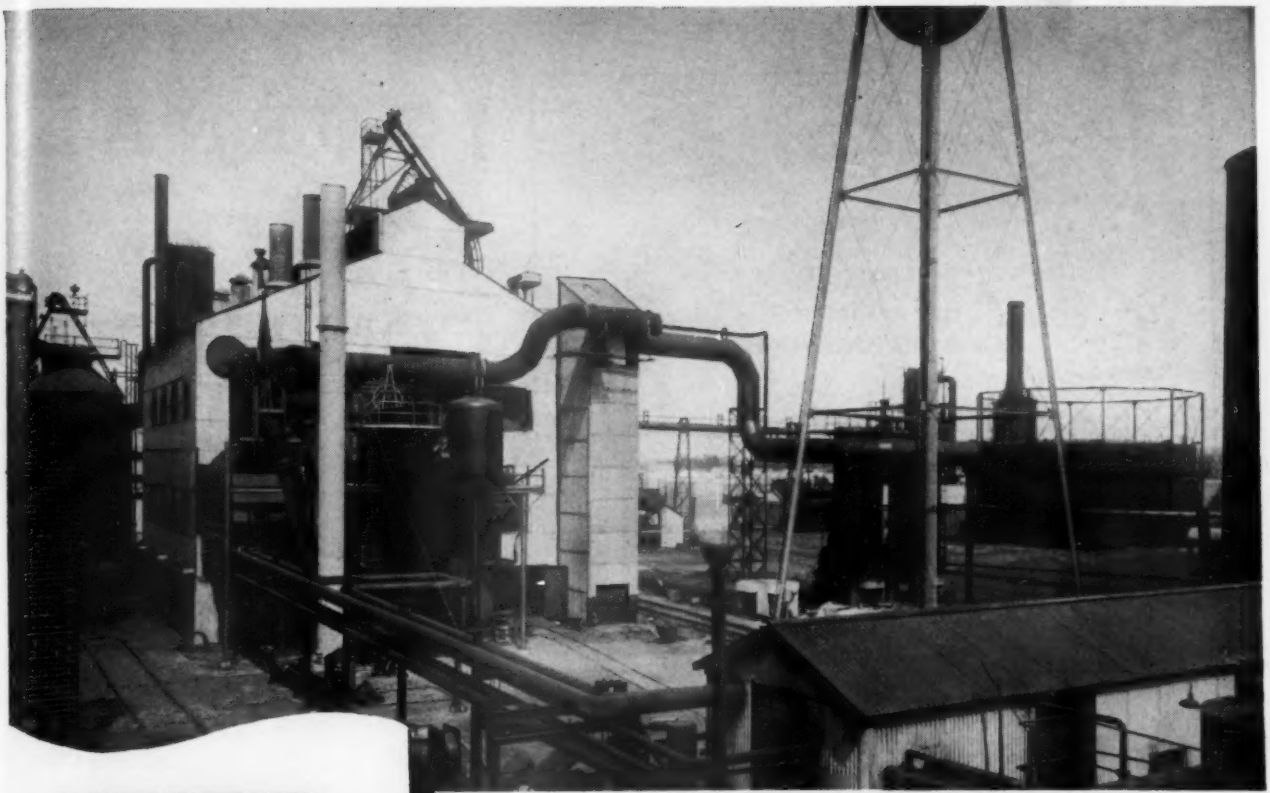
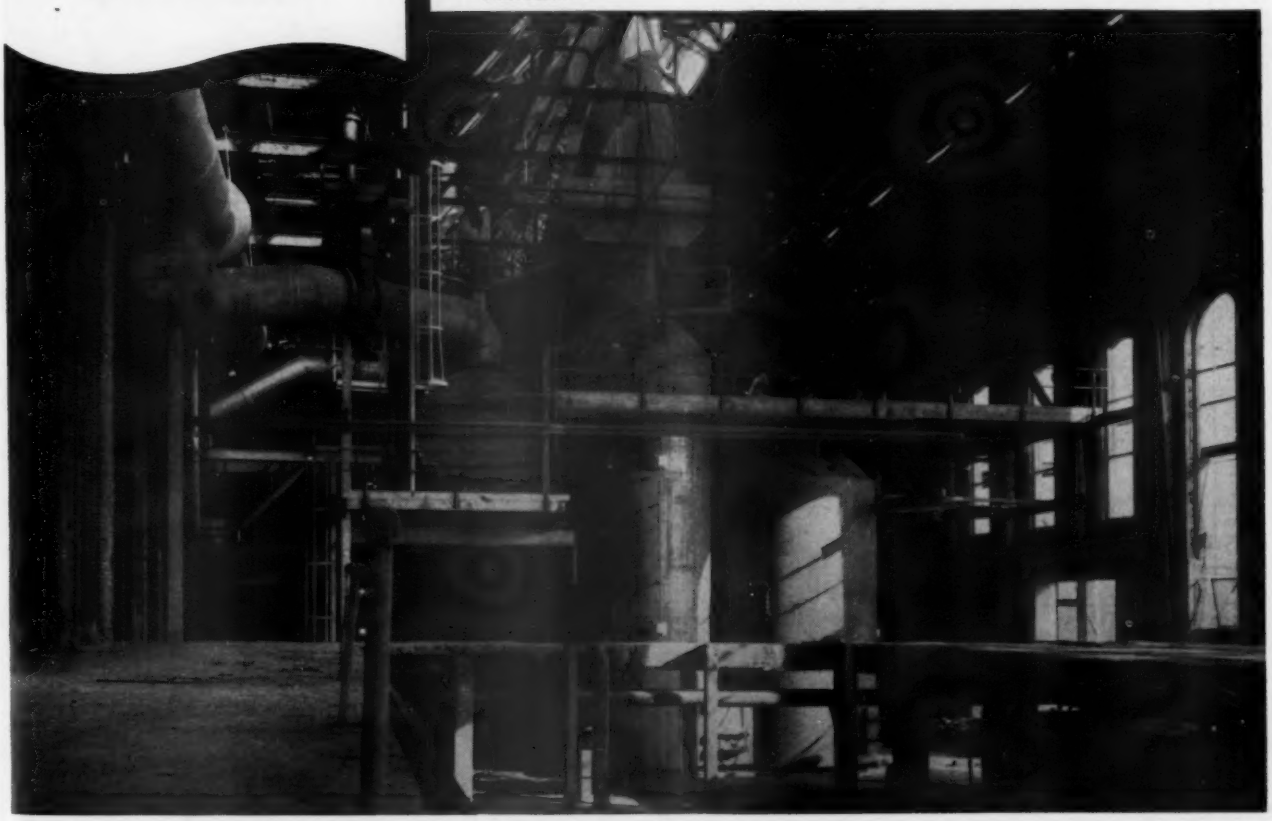
WITH A BACKGROUND OF OVER SEVENTY YEARS' EXPERIENCE

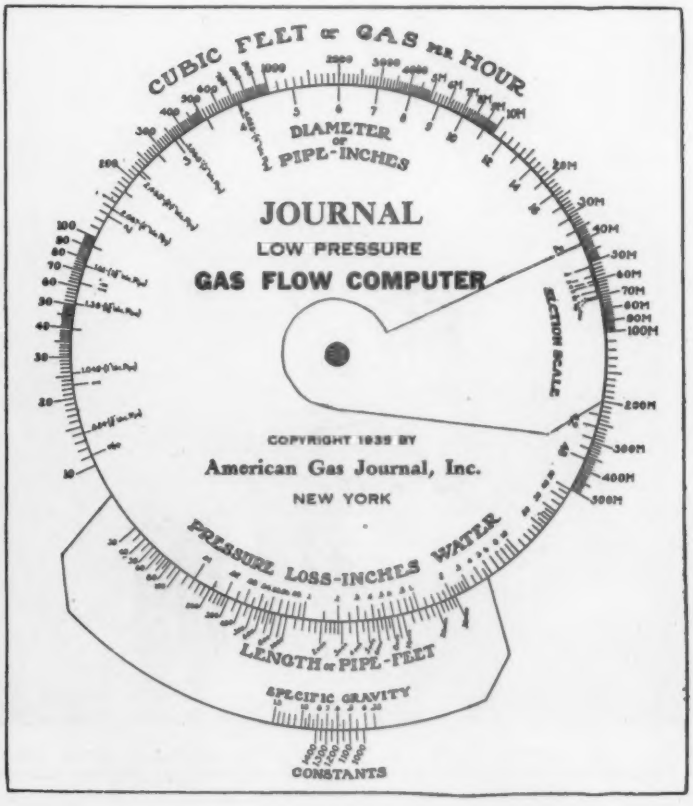


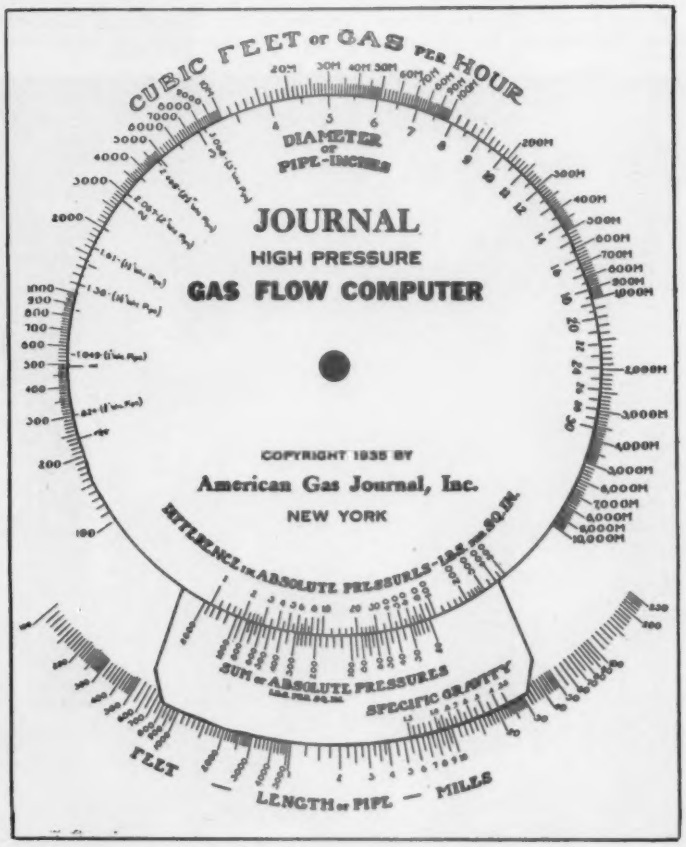
UGI Equipment

The U.G.I. 12'-0" diameter Cyclic Catalytic Reforming apparatus at the Prospect Street Plant of Citizens Gas and Coke Utility, Indianapolis, Ind. This set will reform natural gas as a part of Citizens' mixed gas sendout.

The U.G.I. 13'-0" diameter 4-shell regenerative oil gas apparatus at the Station "A" Plant of the Philadelphia Gas Works Division of the United Gas Improvement Company, Philadelphia, Pa. This set uses the Hall Process of the American Gas Association.







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Specific gravities . . . . . 1.5 to .35
Constants . . . . . 1400 to 1000
Pipe length (feet) . . . 30 to 30,000
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Cubic feet of gas per hour . . . . . 100 to 10MM
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PROOF

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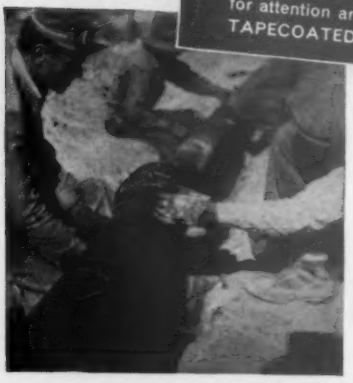
PROOF (Above ground)—A gas line at a bridge crossing was TAPECOAT-protected in 1944. There has been no need for attention and *no interruption of service* since the pipe was TAPECOATED.



Actual experiences like these show what TAPECOAT coal tar protection can do for you.

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Originators of Coal Tar Tape Protection

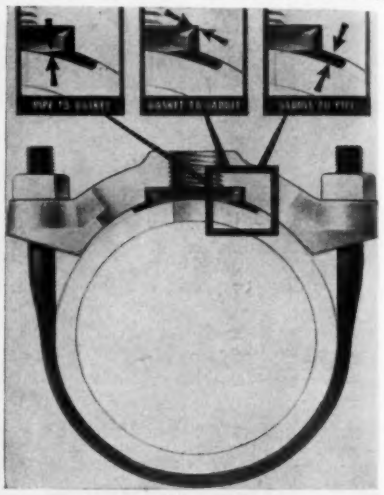
1529 Lyons Street, Evanston, Illinois

lessen the possibility of fracturing from over-tightening the blade collar), and steel blade centers that reportedly guard the saw shaft and strengthen the blade.

Clipper Abrasive Blades. Clipper Mfg. Co., 2800 Warwick, Kansas City 8, Mo.

Service saddle

This newly-designed service saddle is said to offer three sealing elements in the saddle's rubber gasket which combine to effect



a seal between saddle and pipe with only moderate tightening on the U-bolt. The saddle is furnished with single or double straps, either as a cast iron saddle or a bronze saddle. Straps are formed to fit the pipe, so as to distribute evenly the U-bolt pressure. Made for pipe sizes from 1" to 24", and taps from ½" to 4", the sealing technique is described: as the hydraulic pressure increases within the saddle, two wedge tips on the gasket are pressed harder against their sealing surfaces, and complete the seal started by the third seal between saddle and pipe.

ShurSeal Saddle. R. H. Baker & Co., Inc., 2070 E. Slauson Ave., Huntington Park, Calif.

Explosion-proof plugs & receptacles

A new series of explosion-proof plugs and receptacles, connectors for hazardous locations, have been added to the com-

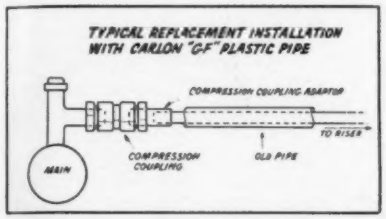
pany's line. The connectors are designed for safe, reliable operation of portable electrical equipment in Class I, group C and D hazardous location and are listed by Underwriters' Laboratories. They have cast aluminum alloy housings with an extra pole connected to the shell for completing the grounding circuit through the

conduit system. A delayed action lock is said to make it impossible to open or close the circuit except when contacts are safely confined within the explosion-proof chamber. The plug is inserted and withdrawn in a straight line. No turning is said to be necessary. They are designed for 15 and 30 amperes, 2-wire 3-pole and 3-wire 4-pole.

Strate-Line EPD & ERR. Pyle-National Co., Chicago, Ill.

Plastic pipe

Two types of plastic pipe for installation of new service lines and replacement of corroded metallic lines have been announced



by the manufacturer. Advantages of the two types, rigid and flexible, include: guaranteed corrosion resistance, elimination of interior build-up, light weight, greater carrying capacity and elimination of electrolysis. The rigid pipe has effective fiber stress of over 3600 psi, and is said to be suitable for use in any climate. It is available in 20-foot sections which may be cut with an ordinary hand saw, and connected with any standard compression coupling, cemented type coupling, or the company's all plastic compression coupling. The flexible plastic pipe, designed for replacement installations, is inserted directly into old service lines, and connected to the service tee by a compression coupling and to the riser by a plastic adapter and compression coupling. It is available in lengths up to 250 feet.

Carlon GR (Rigid) and GF (Flexible) Plastic Pipe. Carlon Products Corp., 10225 Meech Ave., Cleveland 5.

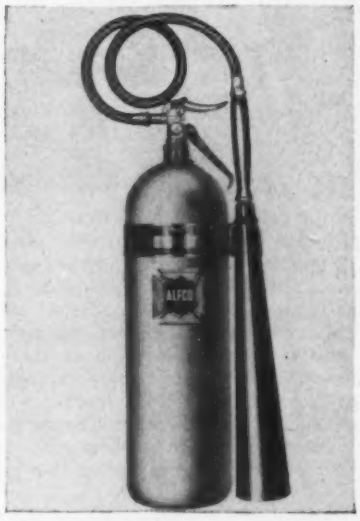
Meter bar regulator

This new meter bar regulator is a complete unit combining the company's standard 173 service regulator with a bar and has been designed for use where a meter bar is required. The meter bar regulator has a vertical inlet in four sizes—½", ¾", 1" or 1¼"—and can be provided with an optional horizontal inlet in ½", ¾" and 1" sizes. The vertical outlet comes in ½", ¾" and 1" sizes, and a union and elbow assembly can be provided with it. Savings in space, installations and service time are claimed as advantages because fewer joints and less piping are involved.

Meter Bar Regulator 173. Rockwell Mfg. Co., 400 No. Lexington Ave., Pittsburgh 8, Pa.

Portable fire extinguisher

This carbon dioxide fire extinguisher, featuring a new faster-acting valve, is available in five models of different weight ca-



pacities. Features of the new valve include: disassembles for servicing without special tools; squeeze lever directly over valve stem gives quicker discharge; hand squeeze needs only finger pressure; removable siphon tube; safety disc side-mounted for protection against damage. A double-prong locking pin reportedly prevents the pin from falling out while extinguisher is being moved, insuring against accidental discharge. The units carry the inspection and approval label of Underwriters' and Factory Mutual Laboratories.

Alfco Model No. 15. American-La-France-Foamite Corp., Elmira, N. Y.

Metal aligning flange gaskets

This metal aligning flange gasket is said by the manufacturer to prevent leakage due to misalignment. A positive sealing design for joining flanges, it reportedly combines strength, safety and leakproof permanence.

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Outstanding features

★Patented open slot lug enables user to drop bolt through slot and tighten.

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★Provides positive, permanent repair. Made of non-corrosive material, 18-8 stainless steel lasts a lifetime.

★Flexible band conforms to pipe irregularities without crushing weak pipe.

★EXCLUSIVE ADAMS FEATURE...Castings have two coats of powdered stainless steel in plastic suspension.

Specifications

BAND—Type 18-8 Stainless Steel
LUG—Malleable Iron
BOLT—Zinc Plated Steel with Heavy Hex Nut
GASKET—Soft Neoprene Rubber

Adams

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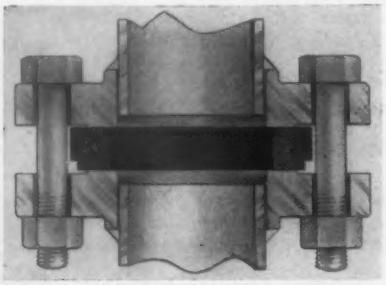
Features of the gasket include: positive seal on alignment up to 6°; can be used with all standard fittings; available with O-ring seal



or metal to metal fit; precision made of different metals according to application. The company reports the gasket has been time tested at over 7,000 psi.

Metal Aligning Flange Gaskets. Vickers Inc., Div. of The Sperry Corp., 2160 E. Imperial Highway, El Segundo, Calif.

High temperature ceramic

This new ceramic is said to be an excellent material for fixtures, jigs and work holding devices for production line han-

dling of brazing, welding, electronic heating, and flame polishing. It may also be used for making pins, pads, plates, spacers and kiln furniture for high temperature sintering operations, and nozzles for welding tips and other high temperature devices. A relatively fine grained silicon carbide, it reportedly has superior properties where high temperatures are involved or where rapid thermal changes occur. The company states that the ceramic has been repeatedly heated white hot and quenched in dry ice without fracturing.

AlSiMag 539. American Lava Corp., Chattanooga 5, Tenn.

Sealing compound

A non-drying, non-hardening sealing compound reportedly insoluble in all petroleum liquids and gases, in steam and aqueous solutions, this product is said to offer insurance against leakage in services commonly found in production assembly and plant maintenance. Unaffected by temperature changes up to 550° F, the manufacturer states that it will withstand air or liquid pressures up to 6,000 psi. Normal vibrations, expansion or contraction will not impair its sealing properties the company reports. Widely used on flanges and gaskets, threaded joints, studs, plugs and screwed fittings, it is effective for sealing in lubricants, and chemicals and gases. It is packaged in 1, 5, 15 or 28 lb. cans.

Plastic Lead Seal. Crane Packing Co., 1800 Cuyler Ave., Chicago 13.

NEW BULLETINS

SPRAGUE 240 METER. The high capacity meter described in this new bulletin is said by the manufacturer to maintain the same dimensions, weight, connections and interchangeability of most parts with the company's standard 1A meter, yet features a 37% greater rated capacity. The meter has a capacity of 240 cubic feet per hour, and weighs 13 lbs. It is 9 7/16" in width, 13⅜" in height, and 7⅜" in depth.

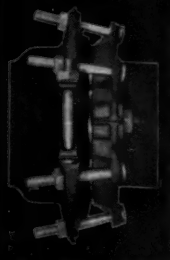
Sprague 240 Meter. Pp. 2. The Sprague Meter Co., Bridgeport, Conn.

GASMACO AUTOMATIC TIME CYCLE CONTROL. For use in oil gas production, blue gas generation and hydrocarbon reforming, among other applications, the automatic time cycle control described in this bulletin features a variable speed drive which provides infinite cycle variations between wide limits. Each control is equipped with interlocks, safety release clutch, safety shutdown for power failure, remote push button shutdown and other safety devices. Features of the control described in the bulletin include: adjustable timing discs, flexibility of operating cycle, automatic thermal control, automatic safety shutdown, and other special control features. The control is available in five sizes, from 5-valve through 9-valve.

Bulletin A-206. Pp. 4. The Gas Machinery Co., 16100 Waterloo Rd., Cleveland 10.

(Continued on page 56)

FOR REPAIRING BELL AND SPIGOT JOINT LEAKS...



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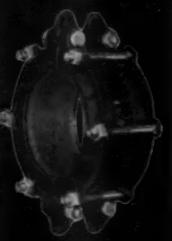

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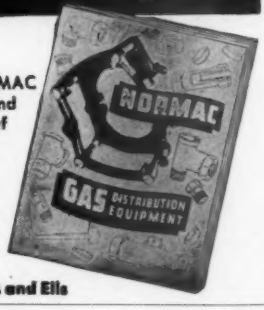

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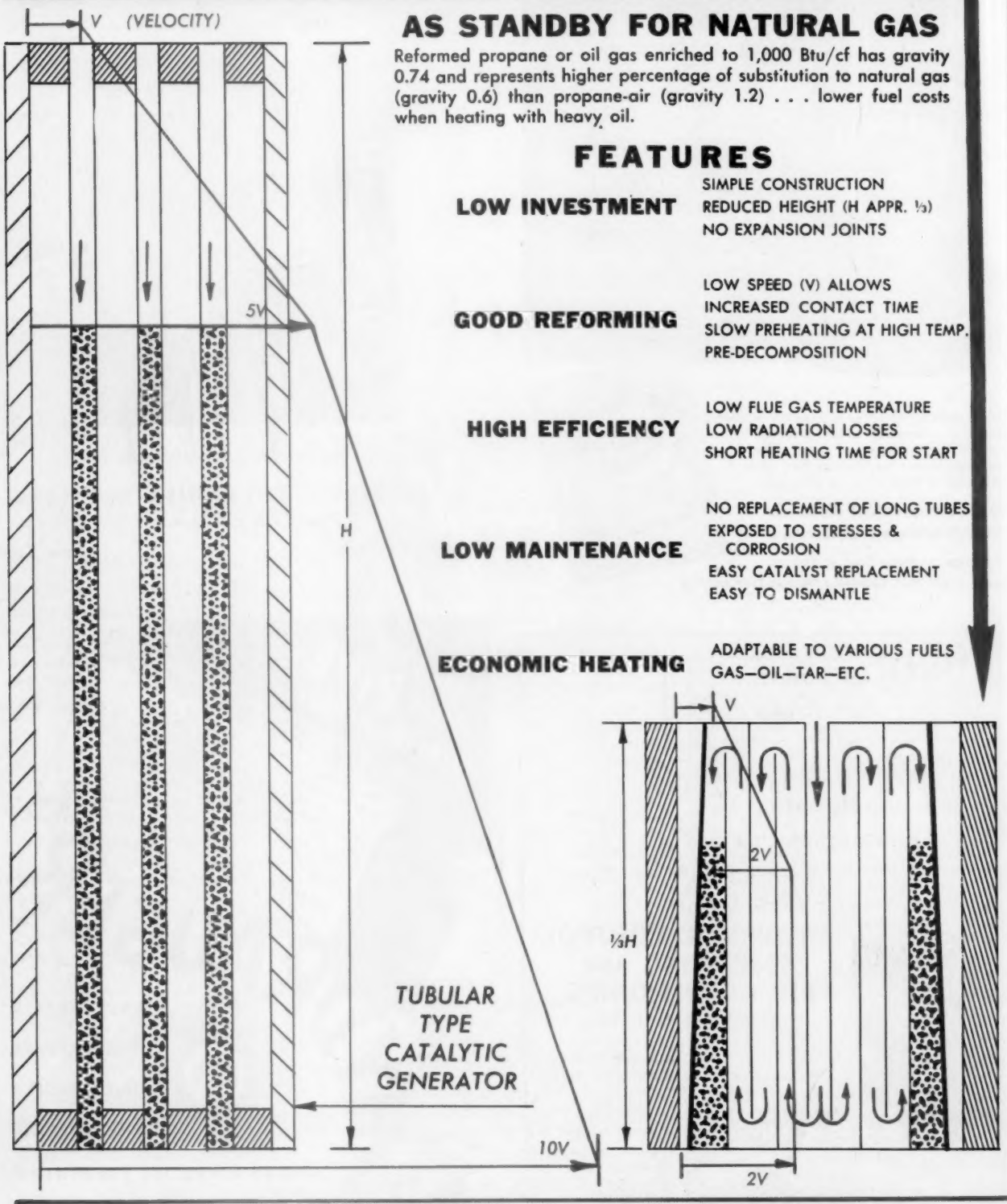

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New Bulletins

(Continued from page 52)

FIBERGLAS FLEXIBLE DUCT LINER. This bulletin describes a glass fiber insulating product for lining the interior of air conditioning or warm air ducts. Made of fine fibers of glass, it is reported the flexible blankets go on easily, soak up sounds inside ducts, set up a barrier to the flow of heat. The bulletin presents information on features of the product, sizes, limitations, application procedure and application specifications.

Bulletin No. IN1.C6. Pp. 2. Owens-Corning Fiberglas Corp., Toledo 1, O.

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11 WEST 42ND STREET • NEW YORK 36, N. Y.

SANGAMO GAS TELEMETER. A reportedly simple pneumatic device permitting outdoor reading of the index of existing inside-installed gas meters is discussed in this bulletin. Two units are involved in installation, the first, mounted on top of the meter, transmits the pneumatic pressure pulsations of a diaphragm through a copper tube to the second unit, the index. The copper connecting tube runs from the index, mounted on a supporting cup with three wood screws on the outside wall of the house, through the wall to the gas meter. In addition to diagrams and photographs the bulletin offers information on installation, adaptability, technical details of operation and economic aspects.

Bulletin 801-3M. Pp. 12. Sangamo Electric Co., Springfield, Ill.

ECLIPSE INJECTOR-TYPE BOX BURNERS. Standard cage, with manual flexible lighting torch, extended cage and open cage type box burners are described in this illustrated bulletin. Said to burn with equal efficiency on low, medium, or high pressure gas, utilizing natural draft, the burner's venturi tube permits the gas stream to entrain a maximum volume of primary air, resulting in high combustion efficiency. The air-gas mixing head, mounted on the injector tube, has an adjustable gas orifice that controls the flow of gas and a shutter that controls the volume of primary air entrained. Available in 3 general types, in a range of sizes and capacities. The bulletin contains capacity tables for low, medium and high pressure gas, photographs of typical installations, dimension and specification tables, and information on extra equipment.

Bulletin H-9. Pp. 8. Eclipse Fuel Engineering Co., Rockford, Ill.

DIFFERENTIAL PRESSURE TRANSMITTER. For flow, liquid level and specific gravity applications, the differential pressure transmitter described in this bulletin is a force-balance transmitter, designed to convert differential pressure into an equivalent 3 to 15 psi output. It can be used to measure flow of liquid, steam or gas; liquid level or specific gravity. It is available in two ranges; 20" to 200" water, and 80" to 800" water. Of the dry or mercuryless type, it is said to be a light weight flow transmitter.

Bulletin 98226. Pp. 8. Taylor Instrument Companies, Rochester 1, N. Y.

MORRIS DUAL-PURPOSE COUPLINGS. The dual-purpose coupling described in this bulletin is of the split compression type. As applied, the coupling exerts uniform pressure throughout the full length of the sleeve. Available in 5 sizes from 4" to 14" inside diameter, with lengths from 8" to 12". The bulletin describes 6 steps to be followed in installation of the sleeve for coupling or repairing gas lines. Gaskets are furnished in rubber, or when specified, in neoprene or other material. The inner sleeve and outer shell of the standard coupling are constructed of heavy zinc coated steel and may be supplied, on special order, in aluminum, stainless steel, copper-clad and other metals.

Bulletin No. 101. Pp. 6. Morris Coupling and Clamp Co., Ellwood City, Pa.

WHEELCO CAPACITROL DIRECT READING TEMPERATURE CONTROLLER. This news bulletin describes the complete line of model 200 series Capacitrols that are used for on-off and proportioning control in the solution of industrial heat control problems. Featured in the bulletin is the new model 221C for straight line temperature control. A complete description of the anticipating control action of the controller has been included. Information is given on: electronic control principle, accuracy and proportioning control. Specifications and operating diagrams are presented.

Bulletin F-5783. Pp. 4. Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.

DUTTON ECONO THERM AUTOMATIC PACKAGED BOILER. This illustrated color bulletin describes the principle of off-center firing featured on the boiler in sizes through 250 hp. according to the manufacturer, off-center firing offers advantages including efficient, positive water circulation in a rotary motion; provides a higher column of water over the hot furnace; steaming is faster with elimination of surging and priming; and the design helps maintain a steady water line even when taking a full head of steam off the boiler. The bulletin also describes the three-pass, modified internal furnace type steam generator which includes a one-piece welded boiler shell, X-ray inspected to meet all requirements of ASME code.

Bulletin EC-1152. Pp. 4. Dutton Boilers, Div. of Hapman-Dutton Co., Kalamazoo, Mich.

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MICROMAX MODEL S INDICATING RECORDERS AND CONTROLLERS. This bulletin describes in detail the design and construction features of the strip-chart recorder. The instrument is used for the continuous measurement and control of key process variables such as temperature. The bulletin offers interior views of the instrument, and illustrates and describes: the sequence of galvanometer detection; typical circuits used; standard features and special features of the recorder. Details of operation are presented, and specifications of standard instruments for measurement and control are listed.

Bulletin ND44(1). Pp. 41. Leeds & Northrup Co., 4934 Stenton Ave., Philadelphia 44, Pa.

GRAYCOTE PLASTIC SEALING COMPOUND. The plastic sealing compound described in this bulletin is said to stop spiral leakage in threaded joints. The compound contains fine powdered lead suspended in a special non-soluble lubricant and reportedly features: seals pressures up to 6,000 psi, withstands temperatures up to 500° F, is insoluble in most liquids and gases, eliminates galling and pitting of metal surfaces, and will not affect stainless steel or other alloys. The bulletin discusses various causes of failure in threaded pipe joints. The sealing compound is Underwriters Laboratories approved.

Bulletin B7A. Pp. 4. Chicago Gasket Co., 1275 W. North Ave., Chicago 22.

GALIGHER ACIDPROOF SUMP PUMP. The sump pump described in this bulletin is said to handle acid sludges, corrosive and foamy products with solids in suspension and all types of pumping where heads up to 35' and flows to 75 gpm are required. A simple welded steel vertical pump, it is completely rubber lined and covered, and operates until the sump level is below the lower suction cover, emptying to 2½" from the tank bottom.

Bulletin SP-53. Pp. 4. The Galigher Co., P.O. Box 209, Salt Lake City, Utah.

ECLIPSE CLOSED FLAME GAS-OIL BURNERS. The series of gas-oil burners described in this bulletin is available for all types of industrial gases and commercial oils, using air at pressures from eight ounces to three pounds. The closed flame dual fuel burner gets its burning efficiency through a nozzle mixing principle provided by the new atomizing oil tip. In addition to applications, the bulletin presents dimensions, capacities, and schematic layouts.

Bulletin R-230. Series "CF." Pp. 4. Eclipse Fuel Engineering Co., Rockford, Ill.

BAILEY METERS & CONTROLS. This illustrated, two-color bulletin offers comprehensive information on the complete line of meters, control equipment and engineering services of the company. It is written for engineers in power plants, public utilities and process plants. Fifteen measured variables common to power and process operations form the index for selecting appropriate metering and control equipment. Basic specifications, illustrations, and detailed literature references are included.

Bulletin 18. Pp. 16. Bailey Meter Co., 1050 Ivanhoe Rd., Cleveland 10.

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GAS INDUSTRY CALENDAR

October

19-21 American Standards Association, Waldorf Astoria Hotel, New York.
19-23 National Safety Council, Chicago.
19-23 National metal exposition, Public Auditorium, Cleveland.
26 AGA Board of Directors, St. Louis.
26-28 AGA annual convention, Kiel Auditorium, St. Louis.

November

9-13 National Hotel Exposition, Kingsbridge Armory, New York.
9-13 American Petroleum Institute, Conrad Hilton Hotel and Palmer House, Chicago.
10 Joint committee on dealer cooperation, AGA, GAMA, Hotel Roosevelt, New York.
11-13 Wisconsin Utilities Association, Hotel Schroeder, Milwaukee, Wis.
17-20 AGA operating section, organization meetings, Hotel New Yorker, New York.
18-20 Mid-Southeastern Gas Association, Sir Walter Hotel, Raleigh, N. C.
29-December 4 The American Society of Mechanical Engineers, Statler Hotel, New York.
30-December 2 Southern Gas Association, advisory council and management conference, Grand Hotel, Point Clear, Ala.

December

1-4 University of Oklahoma corrosion conference, University of Oklahoma.

January, 1954

14-21 National housewares and home appliance exhibits, Navy Pier, Chicago.
17-21 National Association of Home Builders convention and exposition, Chicago.

February, 1954

8-12 Western winter radio-television & appliance market, Western Merchandise Mart, San Francisco.

March, 1954

4-5 AGA transmission and storage conference, Jung Hotel, New Orleans.
15-17 Mid-West Gas Association, Fort Des Moines Hotel, Des Moines, Iowa.
25-26 Oklahoma Utilities Association annual convention, Biltmore Hotel, Oklahoma City.
25-26 New England Gas Association, Hotel Statler, Boston.

April, 1954

5-7 Southern Gas Association (Location to be announced)
12-14 AGA Sales Conference on Industrial and Commercial Gas, Edgewater Beach Hotel, Chicago.
13-15 Southwestern gas measurement short course, University of Oklahoma, Norman, Okla.
20-23 AGA Distribution, Motor Vehicles and Corrosion Conference, Mount Royal Hotel, Montreal, Canada.
22-23 Indiana Gas Association, annual meeting, French Lick Springs Hotel, Chicago.
26-28 Mid-West Regional Sales Conference, Edgewater Beach Hotel, Chicago.
26-28 The 1954 annual convention, Southern Gas Association, Houston.

May, 1954

10 (week) 35th Annual National Restaurant Convention and Exposition, Navy Pier, Chicago.
10 (week) AGA commercial gas school, Chicago.
10-13 LPGA Annual Convention, Conrad Hilton Hotel, Chicago.
19-21 GAMA annual meeting, The Drake, Chicago.
24-26 AGA Production and Chemical Conference, Wm. Penn Hotel, Pittsburgh.
27-28 Natural Gas and Petroleum Association of Canada, Prince Edward Hotel, Windsor, Ontario, Canada.

June, 1954

20-24 Canadian Gas Association, Banff Springs Hotel, Banff, Alberta, Canada.
28-29 Michigan Gas Association, Grand Hotel, Mackinac Island, Mich.

July, 1954

12-16 National housewares and home appliance exhibits, Auditorium, Atlantic City, N. J.
19-23 Western summer radio-television and appliance market, Western Merchandise Mart, San Francisco.

September, 1954

8-10 Pacific Coast Gas Association, Victoria, British Columbia.
28-29 Texas Mid-Continent Oil and Gas Association, Baker Hotel, Dallas.

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